Profile



The mission of the United States Air Force Academy is:

To inspire and develop outstanding young men and women to become Air Force officers with knowledge, character and discipline; motivated to lead the world's greatest aerospace force in service to the nation.

Established in 1954, the Air Force Academy is the newest of the service academies. The goal of this four-year institution is to produce officers who have the knowledge, character, and motivation essential to leadership, pride in all they do, and commitment to an Air Force career.

The Academy is nestled against the eastern slope of the Colorado Rocky Mountains, eight miles north of Colorado Springs and 55 miles south of Denver. The campus is comprised of 18,000 acres situated 7,000 feet above sea level.

Campus landmarks and facilities include the Cadet Chapel, which provides areas to meet the religious needs of cadets. The chapel's seventeen spires, soaring 150 feet into the Colorado sky, present an awe-inspiring sight. Vandenberg and Sijan Halls are coed dormitories that are home to the cadets. These buildings are named for famous Air Force people from the past. The library contains over 700,000 volumes and modern classrooms and laboratories complete the setting for a campus that was designed for the future.

The cadet population includes 4,000 men and women who represent all fifty states, the territories, and several foreign countries.

The faculty comprises more than 500 military and civilian instructors and several visiting professors from around the nation. Exchange officers from the other US services and several foreign countries also make up the faculty total. About 50% of the faculty hold doctorate degrees—they all have masters degrees. The low student-faculty ratio, combined with an average class size of 17, allows for close relationships between cadets and faculty.

Each cadet may select from 30 academic majors offered at the Academy. Minors are offered in foreign languages, and philosophy. Eligible cadets may graduate with more than one major.

Cadets learn about flying through soaring classes and extracurricular flying club activities. Other classes cover leadership, military tactics, survival, and honor. Exciting summer programs include extended visits to active duty bases. An exchange program allows selected cadets to attend school for a semester at one of the other service academies and the Canadian, Chilean, French, German, or the Spanish Air Force Academy. Future plans call for initiating semester exchanges with the Japanese National Defense Academy.

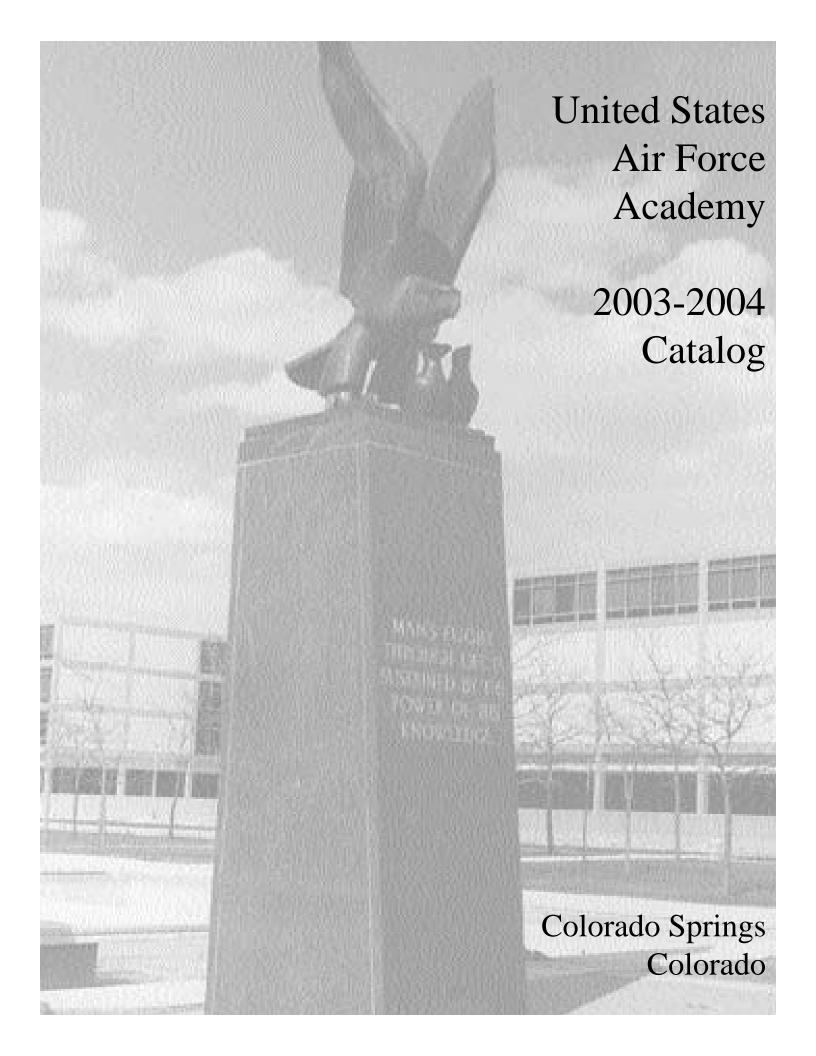
Cadets participate in 27 intercollegiate and many intramural sports.

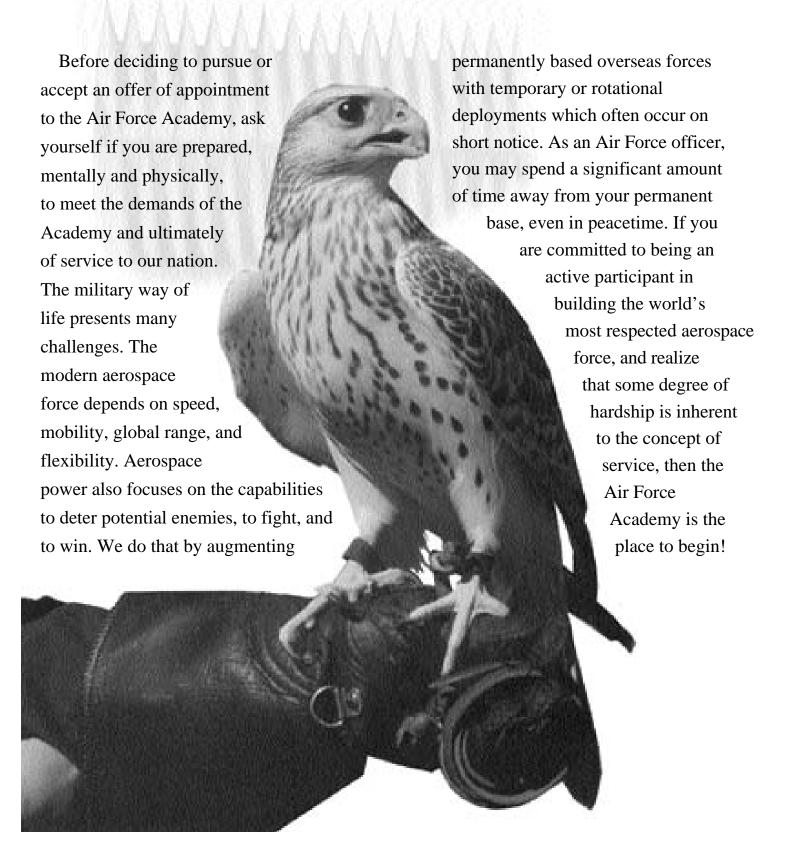
Nearly 100 clubs provide cadets extracurricular training and entertainment, including chorale, drama, skiing, and flying.

At graduation, each cadet is awarded a Bachelor of Science degree and a commission as a second lieutenant in the United States Air Force.

For more information, call the Director of Admissions: 1-800-443-9266 or 719-333-2520 or write: HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025

Visit the Air Force Academy Admissions Homepage at academyadmissions.com





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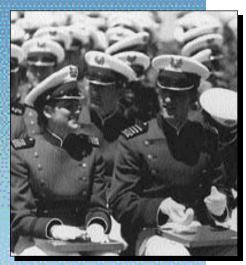
High school students, counselors, and other interested persons who are seeking detailed information about the Air Force Academy, the curriculum and faculty, should use this catalog. Air Force Admissions Liaison Officers (ALOs) receive copies of the catalog. To obtain Academy literature appropriate to your needs, write to the Academy and state the information desired. If you are a student, include your age and grade in school. Send your request to the Admissions Office at:

HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025.

This catalog should not be considered a contract between the US Air Force Academy and any prospective candidate. The curriculum, policies, and dates are subject to change to meet varying requirements of the Air Force.



Developing a Leader



The Air Force Academy develops you by focusing on three broad areas, or "pillars," of instruction: professional military training, academics, and athletics, with an overarching pillar of character development.

The military program develops the techniques and attributes of successful leadership. You gain military and leadership experience through duties in the cadet wing. The wing, patterned after an Air Force unit, allows you to assume responsibility for managing your own military organization.

Military development begins the first summer. Each cadet must take Basic Cadet Training (BCT), a rigorous orientation program spent in physical conditioning, military training, and field encampment exercises. BCT—a test of strength, stamina, and courage—teaches each cadet to conform to strict military schedules and discipline with emphasis on team building.

Besides BCT, the military programs fall into four main areas: Leadership Enrichment Experiences, Cadet Military Training (CMT), Aviation and Airmanship, and Military Education.

You first learn leadership as a concept and then put it into practice, initially at the "follower" level. Later, you gradually develop your leadership skills and responsibilities, including those in earned positions within the cadet wing.

You attend military classes each week, participate in survival training, and go on field trips hosted by Air Force organizations. You become leaders and counselors for activities held at the Academy. Annually, you must pass a professional competency evaluation that emphasizes the duty, commitment, and responsibilities of a professional officer.

All cadets have the opportunity to participate in some form of airmanship each of the four years at the Academy. Experiences range from orientation rides to soaring, and from parachuting to navigation. All qualified cadets may belong to the Cadet Aviation Club and fly light aircraft.

The Military education focuses squarely on the profession of arms. The curriculum encompasses military professionalism, officership, the art of war,

air power, military profession and heritage, military theory, operations and doctrine, and force management.

The academic program covers many undergraduate studies to prepare cadets for both diversified and specialized activities required of Air Force officers. You take a balanced core curriculum consisting of courses in the basic and engineering sciences the social sciences, the humanities, and Military Strategic Studies (MSS). Most faculty members are military officers with advanced degrees whose professional Air Force experiences help cadets see how their studies apply to Air Force issues.

The core curriculum is the heart of the academic program. It familiarizes you with areas of knowledge required for success in today's world. Most classes the first two years will be required courses, with a wider choice of electives during the last two years at the Academy.

Every cadet can successfully complete the academic program. If you excel, you'll pursue honors versions of the core courses as well as electives in your major or other subject areas. Cadets who take advanced courses build an excellent foundation for further academic studies following graduation from the Academy.

The Academy's facilities are among the best in the United States. Small classes encourage close interaction between instructors and students. Well-equipped laboratories support classes in language, science, and engineering. Each cadet owns a personal microcomputer and has access to the local area network which connects dormitory rooms, faculty and staff offices, classrooms, and laboratories. There are more than 700,000 volumes in the library to serve the academic needs of the cadets and faculty.

Air Force Academy athletic programs include physical education, intramurals, and intercollegiate athletics. These vigorous and competitive programs develop many characteristics associated with military leadership. The physical education classes include instruction in aquatics, combatives, physical development, and lifetime athletic skills.

Cadets must participate in intramural or intercollegiate athletics during fall, winter, and spring seasons. Fifteen intramural sports, mostly coeducational, involve competition among all the cadet squadrons. Intercollegiate sports are available to cadets with the ability to compete against teams from colleges, universities, and other service academies. Men participate in 17 intercollegiate



sports, and women field their own teams in 10 sports. Male and female cadets compete in tennis, indoor and outdoor track, rifle, swimming, crosscountry, basketball, fencing, golf, and gymnastics. Women play intercollegiate volleyball. Men play intercollegiate football, baseball, golf, water polo, wrestling, ice hockey, and lacrosse. The teams are known as the "Falcons," named for the cadet wing mascot.

While good character is important in any profession, it is absolutely essential in a military officer. For that reason developing outstanding character is the most crucial "pillar" of an Academy education. At its foundation are the Academy Honor Code and our three core values integrity first, service before self, and excellence in all we do. This foundation is anchored in the bedrock of respect for human dignity and an appreciation for spiritual values.

The Honor Code is the foundation upon which each cadet builds a personal concept of professional ethics and a minimum standard of integrity. Adhering to the code fosters mutual trust and respect which grows throughout the Academy years and beyond.

"We will not lie, steal, or cheat, nor tolerate among us anyone who does. Furthermore, I resolve to do my duty and live honorably, so help me God."

The spirit of these words demands strength, courage, and dedication to a cause greater than self. They are a statement of the most important single aspect of Academy life and are at the center of our core values.

Our core values form the centerpiece of a cadet's ethical standards. These special standards of good conduct are inexorably tied to the military profession's unique demand for self-discipline, stamina, courage, and selfless service to the nation.

Of course, the bedrock upon which any ethical standard rests is the respect for human dignity and appreciation for spiritual values upon which our nation was founded and our constitution is based. Supporting and defending this constitution and all it stands for is the mission of the professional officers the United States Air Force Academy graduates.

Lieutenant General John W. Rosa, Jr., is a 1973 graduate of The Citadel, where he earned a Bachelor of Arts degree in Business Administration. He earned a Master's Degree in Public Administration from Golden Gate University in 1985. The general completed Air Command and Staff College in 1983, the U.S. Army Command and General Staff College in Ft Leavenworth, Kansas in 1987, and the U.S. Army War College at Carlisle Barracks, Pennsylvania in 1994. He attended the Program for Senior Executives in National and International Security Management, at Harvard University in 2000. General Rosa completed pilot training at Craig AFB, Alabama where he was a distinguished graduate. A command pilot with more than 3600 flying hours in A-7, A-10, Hunter, Jaguar, F-16, F-117, HH-60G and HC-130 aircraft General Rosa has served in several instructor, squadron, group, wing, and Joint Staff command positions. In 1979, he completed the Fighter Weapons Instructor Course at Nellis AFB, Nevada, where he was named the Outstanding Graduate. The general has been a weapons instructor in the British Jaguar aircraft at RAF Lossiemouth, Scotland; Commander 35th Tactical Fighter Squadron, Kunsan AB, Korea; Commander 49th Operations Group, Holloman AFB, New Mexico; Commander 20th Fighter Wing, Shaw AFB, South Carolina; Inspector General, Hickam AFB, Hawaii, commandant Air Command and Staff College, Maxwell AFB, Alabama, commander of both the 347th Wing and the 347th Rescue Wing, Moody AFB Georgia. General Rosa's decorations include the Defense Superior Service Medal, the Legion of Merit with oak leaf cluster, Meritorious Service Medal with four oak leaf clusters and the Air Force Commendation Medal and the Combat Readiness Medal with two oak leaf clusters. General Rosa became the sixteenth Superintendent of the Academy on 9 July 2003.



Lieutenant General John W. Rosa, Jr. Superintendent

"The Air Force Academy is a challenging environment by design. Our mission is to inspire and develop outstanding young men and women to become Air Force officers with knowledge, character and discipline; motivated to lead the world's greatest aerospace force in service to the nation. This catalog describes many of the ways we accomplish that mission. Academics, athletics, professional military training, and social activities play a big part. But the most important part of our program is the individual cadet's commitment to hard work, individual and team excellence, development of leadership skills, unquestioned integrity, and strong character. The demands are tough, the rewards are many, and successful completion means becoming an officer in the world's most respected aerospace force!"

Admissions

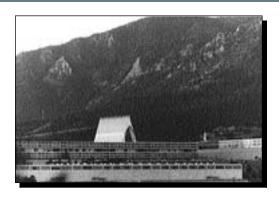
The Air Force Academy is one of the most selective colleges in the country. Start preparing now—junior high school is not too soon—to meet the high admission requirements, intense competition for appointments, and the demands you'll face at the Academy. It takes a well-rounded program of academic, physical, and leadership preparation to meet the Academy's challenge. In addition, you need dedication, a desire to serve others, the ability to accept discipline, and a sense of duty. Home schooled students are as competitive for appointment as any other student—academic, athletic, and leadership potential are evaluated just as any other applicant.

Make your own decision to attend the Academy. Don't let parents or friends make it for you. You will be the one facing the challenges. If you enjoy responsibility, welcome new experiences and opportunities, and like to excel and lead others, you have the attributes to become a successful cadet and Air Force officer.

Academic Preparation

A college preparatory education in high school provides the best background for the Academy's academic challenges. We strongly recommend you take four years of English, including a college preparatory course in writing; four years of math, with a strong background in algebra, trigonometry, and analytic geometry; four years of lab science; three years of social science; and two years of foreign language. A computer course is also helpful. Strive for the best grades possible. Also, develop effective study habits and efficient time management.

Because the ACT or SAT tests are an important indicator of your academic ability, you should plan to take them early. Each of these tests has a slightly different emphasis, so you should take both to reflect your true potential. You may take these tests several times to try to improve your scores. Your highest scores will be accepted. You must have the results in our records to be considered for an appointment (see selection procedures on page 14). When you register for the tests, request your scores be sent to the Air Force Academy. The SAT code for the Academy is 4830 and the ACT code is 0530. See your guidance counselor, Air Force Academy Admissions Liaison Officer, or base education officer for registration procedures and test dates.



Physical Preparation

At the Academy, cadets literally hit the ground running. You'll take the Physical Aptitude Examination (PAE) during the admissions process and a Physical Fitness Test (PFT) every semester while at the Academy. To meet the physical demands of Academy life, develop your fitness by participating in individual and team sports or an individual fitness program. Upper-body strength, running speed, and endurance should be your objectives. Keep in mind, the Academy's high altitude makes cardiovascular preparation a must. You'll take aquatic classes while at the Academy. If you don't already know how to swim, you should learn.

Leadership Preparation

Earn leadership positions in a few selected activities rather than being a member of many. Your athletic and nonathletic activities indicate your leadership potential, but quality of involvement means more than quantity of activities. The following is from the profile of a typical class.

Activity	Percentage of Class
Athletic Letter Award	83
National Honor Society	66
Boys/Girls State or Nation	17
Class President or VP	17
Valedictorian/Salutatorian	16
Eagle Scouts	12



Definitions of Terms

Precandidate—A student interested in attending the Air Force Academy who has returned a completed application/precandidate questionnaire.

Tentative Candidate—A precandidate who appears to have the potential to be a qualified candidate, based upon self-reported information.

Nomination—The selection of a precandidate as an official candidate for admission to the Academy by a legal nominating authority.

Candidate—A precandidate who has a nomination in an authorized category (also referred to as a nominee).

Principal Nominee—A nominee whom the member of Congress ranks as first choice for an authorized vacancy.

Qualified Candidate—A candidate who has met all admission requirements.

Appointment—An offer of admission to a candidate.

Appointee—A competitive candidate who has been offered an appointment to the Academy.

Qualified Alternate—A competitive candidate not chosen to fill any specific nomination category but placed in a nationwide pool from which additional appointments are made to fill the entering class.

Cadet—An appointee who has been admitted to the Academy and has taken the oath of allegiance.

Eligibility

To be eligible for appointment consideration, you must:

- be at least 17 years old by July 1 of the year you enter the Academy,
- not have passed your 23rd birthday on July 1 of the year you enter the Academy,
- be a US citizen (international students authorized admission are exempt from the US citizenship requirement),
- be of high moral character,
- meet high leadership, academic, physical and medical standards, and
- be unmarried, with no dependents.

As Director of Admissions, Colonel Carpenter is responsible for recruiting the nation's finest young men and women for entrance into the United States Air Force Academy. To accomplish this mission, Colonel Carpenter leads a 60 person permanent staff and an Admissions Liaison Officer Program of nearly 2,000 Reserve and active duty Air Force officers. Colonel Carpenter is a 1973 Distinguished Graduate from The United States Air Force Academy. He holds a master's degree from the University of Pittsburgh in economics. He is also a graduate of Squadron Officers School, Armed Forces Staff College, Army War College and the Senior Officials National Security Course. A command pilot with over 5,000 flying hours (3,500 in F-15 A/B/C/D/E). Colonel Carpenter has served at Joint Staff, Major Command and Wing levels including overseas tours in Germany, Korea, and England. He has commanded both F-15 air superiority and F-15E operational squadrons. Prior to being assigned to the Academy, he was Vice Commander of the 1st Fighter Wing at Langley AFB, Virginia. Colonel Carpenter's decorations include: the Defense Superior Service Medal, Legion of Merit, Meritorious Service Medal with three oak leaf clusters and the Air Force Commendation Medal. He returned to the United States Air Force Academy in April 1999, to serve as Vice Commandant of Cadets and Vice Commander, 34th Training Wing. Colonel Carpenter was appointed Director of Admissions in September 2000.



Colonel
William D. Carpenter
Director of Admissions

"The Air Force Academy is one of the most selective colleges in America. We seek young men and women who have the qualities and genuine motivation to succeed in a very challenging environment and whose primary goal is to serve our nation as Air Force officers. The competition for an appointment is extremely high. You must have a proven record of achievement in academics, athletics, extracurricular activities, and leadership. This catalog clearly describes what you need to do and when to do it—the key is starting early. Our professional staff and Admissions Liaison Officers will guide you through each step. For those who are accepted, there are endless opportunities and challenges that wait with a wonderful future in the world's premier aerospace force, and in service to our Nation."

Admission Criteria

We evaluate you on academic, extracurricular, and physical fitness criteria.

Academic performance constitutes the major portion of our evaluation. The composite includes grades in high school and any college courses you may have taken, rank in class, and your college admission test scores. The math SAT and ACT scores count more heavily than English. You receive extra credit for honors and advanced placement courses.

SAT I	Mid-50% Range	Mean
Verbal Aptitude	590-680	633
Math Aptitude	620-700	658
ACT	Mid-50% Range	Mean
English	26-31	28
Reading	28-31	30
Mathematics	27-33	30
Science Reasonin	g 27-32	29

Students who score below 590 verbal and 620 math on the SAT and below 27 math/science reasoning and 26 English/reading on the ACT normally will not be competitive for an appointment.

Test scores must be achieved under national testing conditions taken on a national testing date. We do not accept nonstandard scores (scores achieved on untimed tests).



Rank in High School Class (Typical Class)

First in Class	11%
Top Tenth	57%
Top Quarter	85%

Extracurricular activities, participation and leadership are an important part of our evaluation. We consider all activities in which you may be involved including athletics, all-league or all-state recognition, selection as a team captain, leadership in a school club or student government, participation in scouting or the Civil Air Patrol, and involvement in church or community activities or an after-school job. We assess your physical fitness based on your performance on the PAE.

All these criteria assure that our candidates can succeed at the Academy if offered an appointment.

Application Process

Request a precandidate questionnaire from the Admissions Office, HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025, telephone 1-800-443-9266, after February 1 of your junior year but not later than December 31 of the year prior to entering; however, most questionnaires are returned by October 31 of the year prior to entering. Be sure to include your social security number. Return the questionnaire as soon as possible so we can evaluate your qualifications, schedule you for a physical exam and provide information to members of Congress on your potential as a nominee. Your completed questionnaire must be postmarked by January 31 of the year you intend to enter the Academy.

If you need assistance, ask your high school guidance counselor for the name of the nearest Air Force Admissions Liaison Officer.

Nomination Categories

The laws governing our appointments require that you have a nomination to attend the Academy. Since the nomination process is lengthy, you should seek a nomination at the same time you return your questionnaire (see below regarding congressional deadlines). To increase your chances of being selected, you should apply for a nomination from your US Representative, your two US Senators and the Vice President. (You can find the name and address of your representative at the following Internet address

http://www.house.gov/writerep/. Your senator can be found at http://www.senate.gov). Each member of Congress and the Vice President may have five cadets at the Air Force Academy at any one time. They may nominate up to ten candidates for each vacancy. Vacancies occur when cadets graduate or leave prior to graduation. You also may be eligible for a nomination in one or more of the military-affiliated categories. Use the sample formats included in this section to prepare your requests for nomination. If you are from Puerto Rico, you should seek a nomination from the Governor of Puerto Rico and the Resident Commissioner. If you are from the Commonwealth of the Northern Mariana Islands, write to the Resident Representative. If you are from the District of Columbia, Guam, the U.S. Virgin Islands, or American Samoa, you should seek nomination from your appropriate delegate in the House of Representatives.

Congressional

This is the primary nomination source for most candidates. Apply directly to your two US Senators and your US Representative.

For your US Representative, address your request to:

Honorable (your Representative's name) House of Representatives Washington, DC 20515

For your Senator, address your request to:

Honorable (your Senator's name) United States Senate Washington, DC 20510

No political affiliation is necessary to apply for a nomination. Members of Congress want to nominate outstanding individuals who are competitive for an appointment.

Each Senator and Representative has considerable latitude in awarding nominations; however, most are based upon some combination of academic achievement, leadership performance, and athletic participation. Most members of Congress do not accept requests for nominations after October, so you should contact them in the spring semester of your junior year.

Other Categories

Several other authorities also nominate candidates. The Vice President of the United States nominates from the US at large. The deadline for requesting a nomination in the Vice Presidential category is October 31.

You may address your request to:

Honorable (name of the Vice President)
Vice President
Dwight D. Eisenhower Executive Office
Building
Washington, DC 20501

For the Governor of Puerto Rico, address your request to:

Honorable (name of Governor) Governor of Puerto Rico La Fortaleza San Juan PR 00901

The Governor and Resident Commissioner of Puerto Rico are allowed to have six cadets cumulative at the Academy at any one time. The delegates in the House of Representatives are allowed the following number of cadets at the Academy at any one time:

The District of Columbia	5
Guam	2
The U.S. Virgin Islands	2
American Samoa	1
Commonwealth of the	
Northern Mariana Islands	1

Address your requests to the Resident Commissioner of Puerto Rico and the delegates in the House of Representatives from the District of Columbia, Guam, the US Virgin Islands, American Samoa, and the Resident Representative of the Northern Mariana Islands to:

Honorable (name of appropriate Delegate, Commissioner or Resident Representative) House of Representatives Washington DC 20515

Military Affiliated

To request a nomination in the Presidential, Children of Deceased or Disabled Veterans, Military or Civilian Personnel in a Missing Status, or Children of Medal of Honor recipients categories, follow the sample military-affiliated format included in this section. Mail the letter to the Admissions Office, HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025. If you are eligible to apply in one of the other military-affiliated categories, follow the specific instructions for that category.



Presidential

We may have up to 100 appointments in the Presidential category. This category is reserved for children of career military personnel. To qualify, the parent must meet one of the following criteria:

- be on active duty and have served continuously on active duty for at least eight years,
- have retired with pay or have been granted retired or retainer pay.
- children of reservists may also be eligible (see Section 12733 Title 10 USCfor details).
- for adopted children proceedings must have begun before the child's 15th birthday.
- have died after being retired with pay or being granted retired or retainer pay.

Children of Deceased or Disabled Veterans

The child of a deceased or disabled member of the Armed Forces is eligible if the parent was killed or 100 percent disabled by wounds or injuries received or diseases contracted while in active service or from a pre-existing injury or disease aggravated by active service.

Children of Military or Civilian Personnel in Missing Status

The child of a parent who is in "missing status" is eligible if the parent is a member of the armed services or a civilian employee in active government service who is officially carried or determined to be absent in a status of missing; missing in action; interred in a foreign country; captured, beleaguered, or besieged by a hostile force; or detained in a foreign country against his or her will.

Children of Medal of Honor Recipients

The children of Medal of Honor recipients from any branch of the armed services may apply under this category.

Air Force Regular and Reserve Components

Vacancies are available under this category for members of the Regular Air Force, Air Force Reserve and Air National Guard in accordance with Air Force directives available through any base education office. The application form (AF Form 1786) should be obtained through normal Air Force publications supply channels.

Air Force Reserve Officer Training Corps and Air Force Junior Reserve Officer Training Corps

Five students may be nominated to the Academy every year from each college or university AFROTC detachment as well as honor graduates from each eligible honor high school with Air Force Junior ROTC. College or university students must submit their applications to the Professor of Aerospace Studies. High school students must submit their applications to the Aerospace Science Instructor.

Honor Military and Naval Schools

Any school designated by the Departments of the Army and Navy as an honor school with distinction may nominate five candidates from among its honor graduates. The eligible schools have applications for students.

International Students

International students from countries invited by the Department of Defense may request a nomination to the Academy through an appropriate official of their own government. The request should contain information about the applicant's potential for success at the Academy and should be made at least a year prior to the date of admission. The official's nomination should be received at the Academy by December 31.

International students who graduate from the Academy receive a bachelor of science degree; however, they are not commissioned in the United States Air Force. They go back to their country and serve in their military. The maximum number of international students at the Academy at any one time is 60.



Air Force Academy Cadet Wing Appointments

Current directives set the Air Force Academy's cadet strength at 4,000. The authorized appointments at maximum strength for each nomination category are shown in the following chart. Cumulative appointments are the total number available, of which approximately one-third will enter each year.

The other appointments are allotted annually.

Nomination	Appointments Authorized (Cumulative)
100 United States Senators (5 each)	500
435 United States Representation (5 each)	2,175
Vice President	5
District of Columbia	5
Puerto Rico	6
American Samoa	1
Guam	2
Virgin Islands	2
Commonwealth of the North Mariana Islands	nern 1
Children of Deceased or Dis Veterans or Children of Pers in a Missing Status	
International Students	Maximum Allowed by Law 60
Presidential	(Annual) 100
Regular Components	85
Reserve Components	85
Honor Military and Naval Sc AFROTC and AFJROTC	hools,
Children of Medal of Honor Recipients	No Limit
Qualified Alternates	Number needed to fill each class

Format of Request for Congressional or Vice Presidential Nomination

(This is intended as a guide. A separate letter must be sent to the Vice President and to each Senator and Representative to whom you apply.)
(Contact your Senator and/or Representative before preparing this letter to ensure you send it to their preferred location.)

Date

Honorable (Name of Appropriate Authority) House of Representatives OR United States Senate Washington DC 20515 OR Washington DC 20510

OR

The Vice President
Dwight D. Eisenhower Executive Office Bldg
Washington DC 20501

Dear Mr./Mrs./Ms. (Name) OR Dear Senator (Name) OR Mr. Vice President

I want to attend the Air Force Academy and to serve in the United States Air Force. I request that I be considered as one of your nominees for the class that enters the Academy in June 20__.

My pertinent data is:

Name (print name exactly as it appears on the birth certificate or, if legally changed, attach a copy of the court order): Social Security Number:

Permanent address (street, city, county, state, zip code):

Temporary address (if applicable):

Permanent phone number and area code:

Temporary phone number and area code (if applicable):

Name of father:

Name of mother:

Date and place of birth (spell out month):

Name and address of high school:

Date of graduation:

Approximate grade point average (GPA), rank-in-class and PSAT, PACT/PLAN, ATP (SAT) and ACT if you have taken these tests. Include verbal and math scores for the PSAT and ATP (SAT) tests, the composite for the PLAN, and English, reading, math, and science reasoning scores for the ACT test.

Extracurricular activities:

Reasons for wanting to enter the Air Force Academy:

Thank you for considering me as one of your nominees to the Air Force Academy.

Sincerely

Signature

Format of Request for Military-Affiliated Nomination

(Use this format for any of these categories: Presidential, Children of Deceased or Disabled Veterans, Children of Military or Civilian Personnel in Missing Status, or Children of Medal of Honor Recipients.)

Date

Director of Admissions HQ USAFA/RR 2304 Cadet Drive, Suite 200 USAF Academy CO 80840-5025

Dear Sir:

I want to attend the Air Force Academy and to serve in the United States Air Force. I request a nomination under the (name of appropriate category) for the class that enters the Academy in June 20__.

My pertinent data is:

Name (print name exactly as it appears on the birth certificate or, if legally changed, attach a copy of the court order): Social Security Number:

Permanent address (street, city, county, state, zip code):

Temporary address (if applicable):

Permanent phone number and area code:

Temporary phone number and area code (if applicable):

Date and place of birth (spell out month):

If member of military, include rank, regular or reserve component, branch of service and organizational address including PSC Box Number:

If previous candidate, indicate year:

Information on parents:

Name, rank, social security number, component and branch of service:

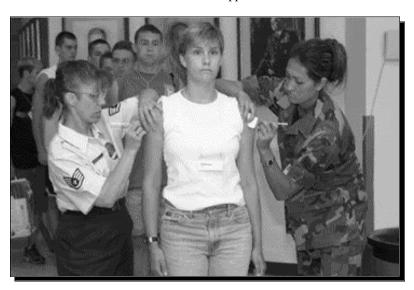
If your parent is on active duty, attach a statement of the service dated and signed by current personnel officer specifying all periods of active duty and any breaks therein. If your parent is retired or deceased, attach a copy of the retirement orders or casualty report; include Veterans Administration (VA) claim number and VA office where case is filed, if appropriate; include brief statement with date and circumstances of Medal of Honor award, if appropriate).

Sincerely	7

Signature

Medical Examination and Fitness Requirements

All academies and commissioning sources use one general standardized examination to determine medical qualifications. You will take your examination at designated examining centers located throughout the United States and at some overseas bases on or after June 1 of the year preceding the year of admission. Prior candidates who are reapplying must retake portions of the medical examination. Specific medical and fitness preparation information is discussed at Appendix A.



Selection Procedures

Your academic and leadership potential, physical fitness, and motivation and aptitude for the Academy determine your rank among the other candidates. Starting in November, the Admissions Panel meets weekly to review completed files. The panel of senior officers considers your qualifications based on all information contained in your records.

The Secretary of the Air Force, through the Superintendent and his senior staff officers, appoints candidates to fill vacancies in each nominating category. We'll notify you of your appointment status by mid-May. Qualified candidates not selected to fill the specific vacancies for which they were nominated are placed in a nationwide qualified alternate pool. We offer appointments to enough people from this pool to fill the entering class. We consider all qualified candidates in all nominating categories and selection is on a competitive basis

Early Notification

If you are a highly qualified candidate and have a nomination, we may notify you of an appointment as early as November, if your records are complete. If you don't have a nomination yet, we'll send you a letter of assurance. As soon as you receive a nomination, you'll receive an appointment. To be considered for an early appointment, our records must include all correspondence about you and the following documents: official results of required examinations (SAT or ACT and Physical Aptitude Examination); candidate activities records; high school transcript; drug and alcohol abuse certificate; and personal data record. If we don't have your medical clearance or your preparatory school or college transcript, you will receive a conditional appointment.

Regular Selections

If you haven't received an early notification, we'll consider you in March if your records are complete and you meet all of our admissions requirements. If we don't have your medical clearance or your preparatory school or college transcript by March 15, you will be considered for a conditional appointment. If we select you, your final appointment will depend on your medical qualifications and our receiving a satisfactory college or preparatory school transcript.

Late Selections

If your records are not complete by March 15, we'll consider you for an appointment at a later date if a vacancy occurs and you are eligible in that category. Some initial appointees decline their appointment offers, and we select other qualified candidates to fill those vacancies. In such cases, we may not notify replacement candidates until shortly before the class enters.

Appointee Requirements

Social Security Number

You must have a social security number to open an admissions file. If you don't have one, ask for an SSA-5 Form from your local Social Security Administration Office. You must furnish evidence of your date of birth, identity, and US citizenship.

Transcripts and Activities Record

You must submit your entire scholastic record from secondary school as well as transcripts for any preparatory school or college you've attended. High school students must submit their current rank in class if known. We also need a high school activities record outlining your performance in extracurricular or other activities which indicate leadership potential.

Birth Certificate or Proof of Citizenship

You must use your name as it appears on your birth certificate on all official records unless the Admissions Office has received legal evidence authorizing a name change. If you are adopted and claim eligibility in a nominating category through an adoptive parent, you must submit a copy of the court order of adoption. Also, adoption proceedings must have begun before your 15th birthday. You must submit proof of citizenship if you were foreign born or naturalized. US citizenship is required unless you are applying as an international student. For tax purposes, international students will obtain a valid social security account number when they arrive.

Travel Expenses

Appointees will receive instructions concerning reimbursement for travel to the Academy. Travel allowances will be credited to your personal checking account. If you refuse to take the Oath of Allegiance upon arrival at the Academy or are disqualified for admission because of some fault of your own, you won't be entitled to any travel allowances.

Service Obligations

Before you take the Oath of Allegiance, you'll sign an agreement, with the consent of your parents or guardian if you are a minor. This agreement states that you'll fulfill the following service obligations, which apply to all cadets except international students.

— complete the course of instruction at the Academy (unless you are disenrolled by proper authority), and

— accept an appointment and serve as a commissioned officer in the Air Force for at least eight years after graduation—five of which must be active duty, and the remainder can be served as inactive reserve. You become eligible to request a separation from the Air Force after five years' service.

If you entered the Academy from the Regular or Reserve component of any service and are discharged from the Academy before graduation, you'll normally return to former rank and branch of service to serve the rest of your obligation.

Graduates who enter pilot training incur a longer commitment when they've completed that training. The Air Force policy in effect when you enter flight training determines the length of your commitment.

Discharge Policy

The policy requiring discharged cadets to serve in the Air Force may vary depending on manpower needs of the Department of Defense. Air Force policy now states:

— fourth- and third-class cadets (freshman and sophomore) who are separated by the Academy or whose resignations are accepted will ordinarily be completely relieved from all military duty—active or reserve.

— second- and first-class cadets (junior and senior) who are separated by the Academy or whose resignations are accepted will normally incur a commitment for active-duty. Exceptions will be made for humanitarian reasons and those few cases in which it is not in the best interest of the Air Force to call a cadet to active duty because of physical disqualification, misconduct or demonstrated unsuitability for military service in an enlisted status. If you incur a commitment, you'll normally transfer to the Air Force Reserve and serve on active duty as an enlisted airman.



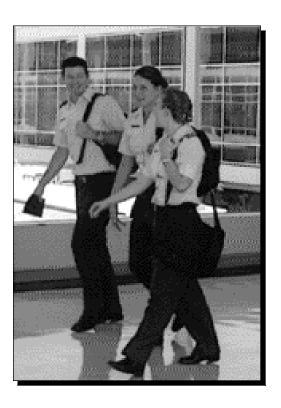


Second-class cadets who are disenrolled or resign on or after the first day of academics in the fall semester of the second-class year will incur a two-year commitment for active-duty service. This commitment is three years for first-class cadets on or after the beginning of the first-class year academic semester. First-class cadets who complete the entire academic program and then resign or refuse to accept a commission may be ordered to active duty for four years as enlisted airmen.

— cadets who fail to complete any period of active duty may incur a liability to reimburse the US government for an appropriate proportion of the cost of their Academy education. The cost of an Academy education is currently computed at \$33,468 per year.

Resignation Policy

A cadet who submits a request to resign must state a specific reason for the action. The cadet will be counseled to determine if the problem can be resolved prior to action being taken to process the resignation.



Admissions Liaison Officers

The Air Force Academy Admissions Liaison Officer (ALO) consists of nearly 2,000 Air Force officers who live in neighborhoods throughout the United States and overseas locations. Lieutenant Colonel Rick R. Ricchi, Jr., Director of Enrollment Programs, and the Regional Directors, oversee all ALO activities, by area, from their offices at the Academy. The Regional Directors may be reached at HQ USAFA/RRPR, 2304 Cadet Drive, Suite 215, USAF Academy, CO 80840-5025, telephone 1-800-443-8187.

Academy Region I: CT, DC, DE, MD, ME, MA, NH, NJ, NY, PA, RI, VA, VT, and WV plus Europe, Africa, Middle East, and all APO AE addresses.

Academy Region II: AL, AR, FL, GA, KY, LA, MS, NC, SC, and TN, plus the Caribbean.

Academy Region III: IL, IN, IA, MI, MN, MT, NE, ND, OH, SD, WI, WY and Canada.

Academy Region IV: CO, KS, MO, NM, OK, TX, Central and South America.

Academy Region V: AK, AZ, CA, HI, ID, NV, OR, UT, and WA, the Pacific region, all APO AP addresses.

An ALO will help you throughout the admissions process. The majority of ALOs are Air Force officers, either Reserve, Air National Guard, retired or active duty, who are very knowledgeable about the Academy and the admissions process. They are qualified to assist you in all aspects of admission and answer questions about the Academy's education and training. In addition, ALOs provide counseling

for the Air Force Reserve Officer Training Corps (AFROTC) commissioning program. They can also tell you what being an Air Force officer will be like after you graduate.

You must meet with your ALO or an Academy representative as part of the admissions process. During an interview with one of them, you may ask any questions you have about the Academy or AFROTC. This is your chance to personalize the selection process and communicate directly with the admissions panel members who review your folder. You are encouraged to contact your ALO at your earliest opportunity.

Ask your guidance counselor for the ALO's name. If your guidance counselor does not know the ALO's name, please contact your Academy Regional Director at 1-800-443-8187.





The Academy Preparatory School

The Air Force Academy Preparatory School, popularly known as the "Prep School," is designed to prepare young men and women academically, physically, and militarily to enter the Air Force Academy. Located on the Academy grounds, this 10-month school affords intensive preparation to make selected applicants more competitive for entrance into the Academy. Approximately 240 students between 17 and 22 years old begin the program in late July. The Prep School's program emphasizes the same four areas as the Academy–academic, military, athletic, and character development. The curriculum includes math, English, and science. Students at the Prep School are addressed as "cadet candidates."

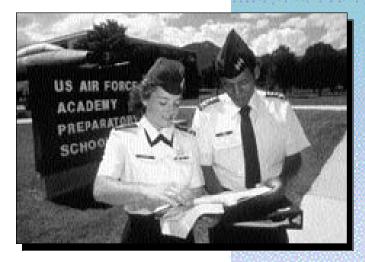
Academics

The Prep School divides the year into four quarters, each approximately six weeks long. An integrated course in basic study skills and reading is provided to aid the transition to the demanding requirements of college academics. The science program is based on problem-solving skills in chemistry. The mission of the English department is to teach cadet candidates to read, think, write, speak, and listen effectively at the collegiate level. The Preparatory School offers a robust mathematics sequence, providing intense instruction in a spectrum of topics including algebra, geometry, trigonometry, applications in science and engineering, and calculus.

Military Training

Military training at the Prep School is centered around the Air Force Core Values: Integrity First, Service Before Self, and Excellence In All We Do. Military training is a part of a cadet candidate's everyday life. Upon arrival at the Prep School, cadet candidates enter a 17-day indoctrination into the military called Basic Military Training (BMT). BMT is designed to orient cadet candidates to the military lifestyle and provide them with information on the organization of the Air Force, military customs and courtesies, drill and ceremonies, military history, Core Values, the Honor Code, and proper wear of the uniform. Cadet candidates are briefed in detail on standards of conduct and appearance they will be expected to maintain while at the Prep School. To ensure they uphold these standards, candidates undergo regular inspections of their uniforms and

personal appearance as well as their rooms and the overall dormitory. The Department of Military Training is headed by the Commander of Military Training. Working directly with each squadron is a senior non-commissioned officer who is the Military Training Leader (MTL). The MTL's role is varied—trainer, disciplinarian, counselor, advisor, and often mentor and confidant to the cadet candidates. Each year is concluded with a 3-day exercise called the Teamwork Exercise or (TX). It is designed to be a physical and mental review of all the cadet candidates have learned for the year.



Character Development

Character development is the process that builds and reinforces the traits which form a cadet candidate's commitment to personal excellence and produces quality officers to lead the Air Force. Implementation of this program is through a yearlong comprehensive process. The Honor Code, human relations, and spiritual development are important aspects of this program. All cadet candidates must accept the Honor Code when entering the Preparatory School. Students must also live by principles of character that extend beyond the Honor Code. Character development training starts during BMT and continues throughout the entire year. Cadet candidates also have the opportunity to participate in community service projects, honor and ethics symposiums, and distinguished visitor testimonials, as part of the continuous character development process.



Athletics

The Prep School Athletic Department's mission is to prepare cadet candidates for the rigors of athletic competition and physical conditioning required of all Academy cadets. The Prep School athletic program includes four main areas—physical conditioning, varsity athletics, intramural sports, and a student athlete program. Each student will be involved in one of these areas at all times during the school year. Prep School varsity athletic teams compete against top rated National Junior College Athletic Association, National Collegiate Athletic Association junior varsity, and other service academy Prep School teams. Our varsity athletic

teams include football, men's and women's basketball, women's volleyball, wrestling, club baseball and club soccer. The student athlete program is designed for student athletes to practice, weight train, and improve their skills in a particular sport where no varsity team exists at the Prep School, or during the off-season of a Prep School varsity sport. Physical conditioning and intramural sports start during BMT and continue until graduation. The Prep School intramural program usually consists of soccer, volleyball, swimming, racquetball, flag football, walleyball, flickerball, and softball. The

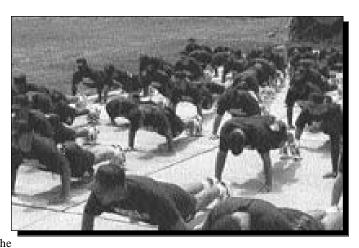
Prep School Athletic Department's philosophy is based on the belief that athletics should be a quality learning experience and leadership laboratory platform. The coaching staff at the Prep School is dedicated to ensuring an effective transition for our athletes to the highly competitive athletic environment at the Academy.

ADMISSION TO THE PREPARATORY SCHOOL

Admission is limited to enlisted members of the Air Force Regular and Reserve components and to selected civilian students. Civilian students applying for, but not receiving an appointment to the Air Force Academy need not reapply to the Preparatory School; they will automatically be considered for a Prep School appointment. Only Air Force enlisted members may apply directly to the Prep School via Air Force Form 1786 submitted through the unit commander and Military Personnel Flight. Consult Air Force Instruction 36-2021 for details. Enlisted members from the Army, Navy, and Marine Corps are not eligible for a nomination in the airman category, but are considered as civilians.

Civilian selectees are placed on active duty as Air Force Reserve airmen while attending the Prep School. Successful completion of the Prep School improves chances for appointment as an Air Force Academy cadet, but appointment is not guaranteed. If not selected for an Academy appointment, Regular Air Force airmen are made available for assignment to other duties. Reserve Air Force candidates are discharged from the Reserves with no further obligation to the Air Force.

For more information about the Air Force Academy Preparatory School, visit <u>academyadmissions.com</u> – click on Admissions Center and then Prep School.



ELIGIBILITY REQUIREMENTS

Prospective cadet candidates must:

- be at least 17 and not have passed their 22nd birthday by July 1 of the year they enter the Prep School,
- be eligible to be a US citizen,
- be unmarried and have no dependents, and
- meet specific medical standards for a commission in the United States Air Force.

FALCON FOUNDATION

The Falcon Foundation provides a limited number of highly-motivated students the opportunity to prepare for admission to the United States Air Force Academy by providing scholarships at specially selected civilian junior colleges and preparatory schools in various parts of the nation.

The Foundation recognizes that many deserving young people with outstanding potential for an Academy education and a desire for an Air Force career need additional academic preparation. The Foundation endeavors to meet this need through its sustaining program of annual scholarship grants. The Foundation recognizes that the request for a scholarship is an alternate plan to obtain additional education because the applicant has failed to gain an appointment on their first attempt.

The Foundation acquires funds necessary to undertake the scholarship program from memberships, contributions and donations. The number of scholarships awarded annually is determined by the funds available. Each sponsorship is dedicated in honor of a pioneer in aviation or individuals who have distinguished themselves in aviation or defense positions.

Each scholarship award provides a significant portion of the cost of room, board and tuition. Scholarship recipients must be able to pay for transportation to and from school and for clothing, laundry and other personal expenses.

Young people who desire to apply for a Falcon Foundation Scholarship should send their requests to:

The Falcon Foundation 3116 Academy Drive, Suite 200 USAF Academy, CO 80840-4480 Telephone 719-333-4096

THE GENERAL HENRY H. ARNOLD EDUCATIONAL FUND

The General Henry H. Arnold Educational Fund provides educational assistance to children of Air Force personnel. Applicants may make their own choice of an accredited preparatory school or college. Request an application from:

Director Air Force Aid Society National Headquarters Washington, DC 20333

Or you may obtain an application online at: <u>http://www.afas.org</u> Colonel Laurence A. Fariss is commander of the United States Air Force Academy Preparatory School, Colorado Springs, Colorado. He directs a 1-year academic, military training, athletic and character development program leading graduates to a possible appointment as an Air Force Academy cadet. The Colonel, a graduate of the U. S. Air Force Academy, earned a Bachelor of Science degree in June 1975. He has a Master of Science degree in Management and Human Relations from Abilene Christian University. He has served in staff and command positions at squadron, division and joint command levels. A command pilot with more than 3,000 hours on C-130, C-141, C5 aircraft, he flew combat sorties in southwest Asia.



Colonel Laurence A. Fariss Commander, USAF Academy Prep School

"The USAF Academy Preparatory School provides a special opportunity for selected young men and women to earn an appointment to the Air Force Academy. Completion of the Prep School's challenging curriculum increases the student's potential for admission to and successful completion of the Air Force Academy. To earn an appointment to the Academy however, students must complete the Prep School, meet Academy entrance requirements, and be selected by the Academy Board. Awaiting those who are offered appointments are superior professional leadership training, an outstanding academic education, and preparation to be a highly successful career officer in the Air Force."

Professional Military Education



The purpose of the Air Force Academy is to produce Air and Space leaders with vision for tomorrow — officers who ascribe to our core values of integrity first, service before self, and excellence in all we do. To that end, we seek to ensure that each graduate enters the Air Force with a unique combination of education and experience—military, athletic, academic, ethical—designed to produce leaders who have special qualities. The experiences are largely intellectual and physical challenges. The challenges begin in Basic Cadet Training (BCT), and continue across the next four years. Meeting those challenges requires dedication, sacrifice, stamina, and courage.

Basic Cadet Training

BCT, a rigorous 38 day orientation program during your first summer at the Academy, introduces you to military life. Your performance and attitude in this program will strongly influence your future success at the Academy, so be sure you understand that BCT is a serious and very rigorous undertaking.

Arrival

As soon as you arrive, you'll recognize the Air Force Academy is not a typical college or university—it's a military institution and, the demands are unique. You'll shed civilian clothes for military uniforms, and your hair will be cut to Academy standards. You may not use tobacco products during BCT. If you smoke, dip, or chew, you should quit before you arrive so you can adapt more easily. From the start, secondand first-class cadets help you make the transition from civilian to Air Force life. They'll teach you everything from marching and proper wear of the uniform to how to complete the

Assault Course. The first day of BCT will be a long one, full of new sights, sounds, situations, and experiences. It will remain forever etched in your memory.

Oath

Shortly after you arrive, you'll participate in one of the more solemn occasions of your cadet career—taking the oath that makes you a member of the Armed Forces of the United States. This is the pledge of loyalty:

I, (name), having been appointed an Air Force cadet in the United States Air Force, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and I will well and faithfully discharge the duties of the office on which I am about to enter. So help me God.

Consider what this country means to you and what defending it involves. You must serve wholeheartedly. If you have any reservations, resolve them before you commit.

The Rigors of BCT

Each of BCT's two phases—one in the cadet area, the other in Jack's Valley—makes its own demands and offers its own rewards. BCT will challenge you physically, mentally, and emotionally. Few of your high school friends will ever face such tests. Your commitment to yourself, to those close to you, and ultimately, your nation, will be tested daily. You'll expand your limits and emerge with a deep sense of





pride and confidence in your accomplishments and abilities. You'll begin to understand what sets the Academy apart from other colleges and universities.

BCT in the Cadet Area

This phase focuses on the transition from civilian to military life. Upper-class cadets instruct you in military topics ranging from customs, courtesies, the Honor Code, Air Force heritage, marching, to room inspection. You'll demonstrate your proficiency through knowledge tests, drill, rifle-manual competitions, parades, and inspections. Your daily physical conditioning training includes strenuous exercises, running, and competitive sports. All activities condition you to meet the physical demands of BCT in Jacks Valley and the academic school year.

Field Day

During Field Day, your squadron competes against other BCT squadrons in events such as distance races, log relays, and the tug-of-war to test teamwork. Points earned, added to those awarded throughout BCT for marching, knowledge tests, and performance in various other activities, determine the "honor squadron."

BCT in Jacks Valley

Following the military and physical preparation of BCT in the cadet area, training continues in Jacks Valley, a wooded area on the Academy grounds. Your stay in Jacks Valley will involve many activities which will push you to your physical limits and build within you self-confidence and confidence in your classmates. You'll also become familiar with small-unit tactics and firearms. After a challenging and rewarding experience in Jacks Valley, BCT training concludes back in the cadet area.

Acceptance Parade

The end of BCT and transition into the academic year are marked by the Acceptance Parade. There you will receive your fourth-class shoulder boards to recognize completing BCT and to signify your acceptance into the cadet wing. In a ceremony associated with the parade, new fourth-class cadets culminate the intensive BCT ethics and human relations training by taking the Academy Honor Code Oath and pledging to live by its principles. It's

Brigadier General Johnny A. Weida graduated from the Air Force Academy in 1978. He is a command pilot with more than 4,000 hours in F-16, T-37, T-43 and TG-7 aircraft. General Weida earned a Master's Degree in Public Administration at Golden Gate University in 1987, and a Master's Degree in National Security and Strategic Studies at the Naval War College in 1993. General Weida has commanded at the squadron, group and wing level and has served in numerous staff assignments including flying as a member of the USAF Thunderbirds Aerial Demonstration Team at Nellis AFB, Nevada. The general was an instructor pilot and flight examiner at Shaw AFB, South Carolina, and Williams AFB, Arizona, he also served in staff positions at Kunsan AB Korea, and at Air Staff Plans and Programs. He is a graduate of Air Command and Staff College, and the National Security Management Course at the University of Syracuse. General Weida's decorations include the Defense Superior Service Medal, Legion of Merit with one oak leaf cluster, Distinguished Flying Cross, Air Force Meritorious Service Medal with four oak leaf clusters, Air Force Commendation Medal and the Air Force Achievement Medal. On 10 April 2003, General Weida was sworn in as the 22nd Commandant of Cadets at the United States Air Force Academy.



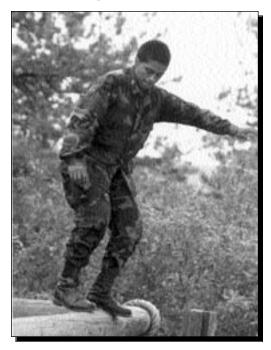
Brigadier General
Johnny A. Weida
Commandant of Cadets

"Our nation requires intelligent, assertive, well-rounded young men and women as leaders and defenders of freedom. The mission at the United States Air Force Academy is to inspire and develop outstanding young men and women to become Air Force officers with knowledge, character, and discipline. Rock solid integrity is essential for honorable military service to our country. A cornerstone of cadet life at the Academy is the Cadet Wing Honor Code that states: 'We will not lie, steal or cheat, nor tolerate among us anyone who does.' Rigorous military training, a stimulating academic curriculum, and challenging athletics highlight the four-year Academy program. The Academy's world-class military training and academic curriculum prepares graduates to meet the diversified and specific challenges of military service. From survival school to flying sailplanes, you'll have opportunities to demonstrate 'excellence in all we do' while learning and growing physically, mentally and spiritually. It's not easy to get into the Academy; it's even tougher to make it through to graduation—but it's more than worth every bit of the effort."

the end of one test but the beginning of another—meeting the new and different challenges that each succeeding year at the Academy will bring.

Meeting the Challenge

The training you'll receive during your fourth-class year will serve as a foundation for your conduct throughout your time as a cadet and career as an officer. You, as a fourth-class cadet, are expected to enter the Academy armed with physical fitness, mental resolve, enthusiasm for competition and challenge, and an attitude positively directed toward success. Your training will be rigorous and well-disciplined, designed to test and strengthen your motivation and capabilities.



Along with BCT, the fourth-class year will probably be more emotionally and physically demanding than anything you have done in your life. To succeed, you must accept the challenges that the Air Force Academy presents, realizing that the training you receive is directed toward making you an effective member of the Air Force. You commit strongly to succeed at the Academy. Candidates who enter training because of pressure from peers or parents, with the attitude that they'll just "give it a try," usually have great difficulties. More than 32,000 graduates have met the challenges of the fourth-class year and have succeeded. You too can join that group of winners.

Professional Development and Military Strategic Studies Programs

The four-year Cadet Military Training (CMT) will offer you the Air Force knowledge and skills necessary to adapt to the Academy environment and succeed in the military profession.

The Military Strategic Studies (MSS) curriculum is incorporated into core academic classes you'll take during your fourth-, second-, and first-class years. It addresses military professionalism, officership, airpower theory and doctrine, force employment, military theory, and the art of war. Together, professional development and MSS are the educational foundation for all Commandant of Cadets' military-education programs at the Academy.

All MSS instructors must have at least a master's degree, and many have PhDs. Both MSS and CMT incorporate the latest advancements in computer-aided instruction, and instructors must complete initial and continuing qualification courses to maintain top proficiency in the classroom.

Fourth-Class Year

The fourth-class CMT provides you with an initial foundation of Air Force history, heritage, honor, discipline, drill, and followership skills. The focus is on developing your appreciation for the qualities of a professional officer, while stressing individual professional values such as self-discipline, teamwork, duty, and commitment. When you've completed the fourth-class year, you'll feel accomplished and self-confident. Moreover, you'll have the sense of responsibility, self-discipline, and duty required of a third-class cadet.

The first exposure to MSS is through the fourthclass course "Introduction to Military Theory and Air & Space Power." You'll study such subjects as Air Force functions, leadership, operations, air power doctrine, and career opportunities. This class is your first major step toward becoming a warrior leader; it lays the foundation for the subjects covered in upper-class MSS courses.

Third-Class Summer

During your third-class summer, you'll learn survival, land navigation and water survival skills that you'll use throughout your military career and beyond. You'll put these techniques to use during an intensive three weeks as you trek through the nearby Rocky Mountains and learn to find your way, build your own shelters, and forage for food. This controlled environment is the perfect laboratory for future fliers to develop their ability to survive in the most demanding situations.

Going through Global Engagement as a third-class cadet, you will find out what it takes to support the aircraft you may someday fly. From contingency experienced officers and enlisted personnel, you will acquire skills in expandable, modular tent setup, contingency utilities, passive defense, force protection, security force individual and team movement, mortuary affairs, contingency food service and much more. We'll explain concepts and you will receive personal experience as part of an Air Expeditionary Force deployment, employment and redeployment.

Some of the most exciting experiences of the thirdclass summer involve flying, as you will read later in the aviation part of military education.

Third-Class Year

The third-class CMT concentrates on the transition from a follower to a leader. As a third-class cadet, your main goal is to become an effective military role model and to learn how to be an effective military teacher, mentor, and trainer. The third-class cadet program prepares you for increased levels of responsibility, helps you internalize standards essential for success (both at the Academy and in the operational Air Force), and equips you with training and skills required of leaders. You'll receive extensive experience using the Academy Training Philosophy to include establishing expectations, providing skills, exchanging feedback, and ensuring the professional growth of your subordinates.

Second-Class Summer

During your third summer at the Academy, you'll apply your leadership skills and increase your knowledge of the rest of the operational Air Force. You'll practice leadership principles while serving as cadre members in the Combat Survival Training (CST) program, BCT, Global Engagement (GE), or as instructors in parachuting, soaring, or navigation. You'll have the chance to practice your leadership style while directly contributing to the professional growth of other cadets. You will visit and interact with members of an operational unit during Operation Air Force, a three-week program during which you'll experience firsthand the mission and lifestyle of Air Force airmen, noncommissioned officers (NCOs), and company grade officers. Cadets are sent all over the world to operational Air Force bases. Operation Air Force is one of the most rewarding experiences cadets receive during their four-year education.

Second-Class Year

The second-class CMT will prepare you for your responsibilities as the primary trainers of third-and fourth-class cadets. You'll receive instruction in practical leadership and supervisory skills as you serve in senior NCO positions within your squadron chain of command. You will be a technical expert in drill and ceremonies, personal appearance, and room inspections, and you will train the third- and fourth-class cadets. In addition, you'll be taught specific leadership and organizational improvement skills needed by junior officers and examine how to apply these skills correctly when you run the cadet wing as a first-class cadet.

"Foundations of Aerospace Power," taken during the second-class year, analyzes the use of aerospace power in combat. You will study basic airpower doctrine and employment concepts built on your knowledge of the airpower profession gained in the previous MSS class. Case studies will help you examine how air commanders have applied the principles of war in specific battle campaigns, and you will practice warfighting principles in a computer-based wargame.

First-Class Summer

As first-class cadets, you and your classmates will take the reins of command as the cadet wing leadership. The positions of responsibility you will hold and your leadership skills will contribute to the success of the Academy's military training programs during your final summer at the Academy. BCT, CST, GE, aviation, and airmanship programs will all rely upon you for meaningful training and learning. This is your chance to put the finishing touches on your leadership style and skills as you prepare to be commissioned a second lieutenant.



First-Class Year

As a first-class cadet, you'll serve as a cadet officer in leadership positions throughout the cadet wing. You'll practice your leadership skills by leading and supervising the professional development of the lower three cadet classes. Your leadership experiences will be invaluable when assuming the responsibilities of a second lieutenant.

The first-class CMT is designed to prepare you for commissioning as a second lieutenant in the United States Air Force. Thus, you'll learn basic, "need-to-know" information for prospective officers.

First-class cadets take "Introduction to Joint and Multi-National Operations," which teaches basic service doctrine and its relationship to current force structure. This course introduces you to the issues involved in joint and multinational military operations. Basic themes include the US joint command structure, multinational warfare and the

joint employment of air, ground and sea forces across the range of military operations. Case studies provide a basis for studying the concepts and challenges of joint and multinational operations, and will help you examine how each service contributes to overall victory.

Cadet Commanders' Leadership Enrichment Seminar

Military training at the Air Force Academy also includes specific leadership enrichment experiences for cadet commanders. From wing commander through squadron flight commander, cadet leaders must face the challenges that come with having the success of 4,000 members of the cadet wing in their hands, but you don't face this challenge alone. To help you succeed in your first real tests of command, the Academy conducts seminars on teamwork, communication, problem solving, delegation of authority, setting standards, wing goals, and conflict resolution. These seminars are very popular among cadets and have proven to be highly successful in helping develop the leadership skills of our future Air Force leaders.



The Chain of Command

Integral to all aspects of military education is how cadets live and work in their daily activities. The cadet wing is organized into a military chain of command to mirror the organization of the rest of the Air Force. First-class cadet commanders and their cadet staffs command thirty-six squadrons of approximately 110 cadets each. Those commanders in turn report to four Cadet Group Commanders who

are led by the Cadet Wing Commander, the cadet in charge of the entire cadet wing. Supervising these cadets are Air Officers Commanding (AOC), located in each squadron and group. These Air Force officers oversee all cadet activities, provide instruction, and serve as role models as the cadets experience firsthand the processes of command and organization to accomplish the mission. The Military Training Leader (MTL) complements the AOC and provides an enlisted role model perspective. Across the wide spectrum of cadet activities, from meals in Mitchell Hall, to the intramural athletic fields, to living arrangements within the dorms, the organizational focus is on the squadron.

Aviation and Airmanship Programs

A very large part of the Commandant of Cadets' military education program involves flying. Some of the most enjoyable training you will receive is in aviation and airmanship courses offered

throughout your four years at the Academy. As early as BCT, you'll be exposed to air power via multiple flyovers of America's top-line fighters and bombers. You might also receive an orientation ride in a helicopter. After BCT, your training continues with instruction in the concepts of flight, navigation, and operations. Nearly all cadets are enrolled in a soaring course during their third class year, where you'll pilot a sailplane and have the chance to solo. You'll also have the opportunity to take an elective course in freefall parachuting, complete five freefall parachute jumps and receive your basic military jump wings. You'll even have the chance to become an instructor in various aviation and airmanship programs. Cadets who desire and are qualified for Undergraduate Pilot Training (UPT) after graduation take a flight-screening course during their first-class year, in which they learn to fly and solo a propeller-driven aircraft. Altogether, aviation and airmanship courses will familiarize you with important activities in the Air Force and will possibly introduce you to a satisfying career in aviation.

Aviation

During the fourth-class year, you'll have an opportunity to participate in a voluntary aviation program called "Project Fledgling" that includes a classroom introduction to basic aviation principles, as well as "flying time" in T-37 simulators. Elective aviation courses provide firsthand flight experience while furthering your knowledge and understanding of the flight environment. They teach flight concepts, basic and advanced aviation, and instrument principles and procedures.

The aviation courses offered are varied, ranging from a course on Air Force combat operations to courses designed to prepare graduates to excel at Undergraduate Flight Training (UFT). Additional aviation courses will give you the opportunity to prepare for the Federal Aviation Administration (FAA) private pilot and instructor pilot examinations. We even offer selected cadets a chance to serve as Cadet Aviation Instructors, where they gain invaluable leadership experience both in the air and on the ground.

Airmanship Programs

Soaring

Nearly all third-class cadets receive instruction in flying a two-seat sailplane. Air Force pilots supervise the soaring program but cadets run it. Cadet instructor pilots provide most ground and flight instruction. Students in the basic soaring course may apply for enrollment in an advanced course that trains cadets to become soaring flight instructors. In this and other advanced courses, you can experience many aspects of soaring flight.



Parachuting

Cadet volunteers who meet stringent physical requirements may enroll in the parachute program. Completing five freefall jumps earns you the Air Force parachutist badge. Selected cadets from the basic parachuting course may enroll in the parachute instructor course. Graduates of this course instruct others in the basic parachuting course and participate in advanced parachuting activities, to include demonstrations for the "Wings of Blue" parachute team.

Introductory Flight Training (IFT)

First-class cadets who are selected to enter UPT after graduation must take the Introductory

Flight Training (IFT) course. This training includes Federal Aviation Administration (FAA) approved ground school and flight instruction which results in an FAA private pilot license. Both contracted civilian certified instructors and Air Force pilots teach this program. You'll log about 50 flight hours in this program.

Extracurricular Flying

The Academy has an Aero Club in which you can learn to fly club-owned aircraft during your free time. You may also join the Cadet Aviation Club. Members of this club are interested in general aviation and meet regularly to discuss and organize various club activities. As a member of the Aero Club or the Aviation Club, you receive discounts and privileges on certain aviation activities, including the chance to earn Federal Aviation Administration ratings.

Intercollegiate Competition

Cadets at the Academy who demonstrate high levels of ability in airmanship programs can compete at the intercollegiate level. Cadet Soaring Instructors compete in regional and national cross-country soaring and aerobatic events as members of the Cross-Country Soaring Team and the Aerobatic Demonstration Team. Cadet members of the Wings of Blue parachuting team compete in events throughout the country, culminating at the College National Parachuting Championships. Cadets on the USAF Academy Flying Team also compete in regional and national level events. All of the teams are nationally recognized and perennially earn top honors. These teams also conduct demonstrations at public events at the Academy, throughout the nation, and even internationally.

Some cadets may compete on the intercollegiate level in parachuting and flying of light aircraft. Cadets who qualify may become members of the Wings of Blue parachuting competition demonstration team or the USAFA Flying Team. The two teams compete in events throughout the country. Both teams are nationally recognized and perennially earn top parachuting and flying honors. These teams also conduct demonstrations at public events as well as athletic and military functions at the Academy.

The Center for Character Development

"To educate a person in mind and not in morals is to educate a menace to society."

-T. Roosevelt

The USAF Academy defines character as: "Qualities of moral excellence which compel a person to do the right thing despite pressure or temptations to the contrary."

The Center's mission is to facilitate programs and activities throughout all aspects of cadet life which help cadets develop this internal moral compass. Its objective is to graduate officers who:

- Have forthright integrity, and voluntarily decide the right thing to do and do it.
- Are selfless in service to the country, the Air Force and their subordinates.
- Are committed to excellence in the performance of their personal and professional responsibilities.
- Respect the dignity of all human beings.
- Are decisive, even facing high risk.
- Take full responsibility for their decisions.
- Have the self-discipline, stamina and courage to do their duty well under the extreme and prolonged conditions of national defense.
- Appreciate the significance of spiritual values and beliefs to their own character development and that of the community.

Such qualities are caught as well as taught, and thus the Center offers programs for both cadets and staff. Staff education and training programs in character and leadership development, human relations, honor and mentoring work to create a character enriching environment. Cadet character and leadership education follows a developmental character education plan which aims to provide the fundamental knowledge early in the cadet career, followed up with a wide variety of developmental experiences to help cadets internalize the motivation for personal character development.

The Center for Character Development is organized into four divisions. The Honor Division administers the honor code and educates Academy personnel regarding the honor system. The Character and Leadership Education Division provides character-based honor and leadership education and training. The Human Relations Division focuses on fostering a healthy social climate and offering programs which encourage a respect for human dignity. The Excellence Division organizes symposiums, conducts seminars, and offers a variety of forums for cadets to pursue their own character development.

The Honor Division guides the Cadet Honor Committee in administering the Cadet Honor Code. Administration of the code involves adjudicating possible violations and recommending appropriate sanctions. The Honor Committee is composed of first- and second-class cadets elected from each

squadron. They form the honor instructor cadre and are responsible for guiding cadets through the system should they be charged with violating the Code. Active duty personnel in the Honor Division oversee this process and ensure the Commandant or the Superintendent are provided complete case files. Although the presumptive sanction is disenrollment, the Commandant may sanction probation for a designated period on a case-by-case basis. Factors considered in sanctioning are the cadet's experience under the Code, nature of the violation, forthrightness, and whether the cadet admitted or denied the violation.

In a profession that demands leadership, it is essential to develop leaders with a solid moral foundation. To reach that goal, the Character and Leadership Education Division provides a variety of classroom, seminar, workshop, and experiential-based learning programs to all cadets, beginning when they enter Basic Cadet Training (BCT), and continuing each year through their last semester at the Academy.

The bedrock of moral and character education begins with a solid understanding and internalization of the cadet honor code. Instruction on the code, system processing, and the honor probation program begin during BCT, and continue throughout a cadets' four years at the Academy. In the first two years, instruction focuses on understanding and living under the Code, and in the final two years, emphasis is placed on cadets living an honorable life, while helping others to do the same.

Living by the Honor Code is but one aspect of character development at the Academy, as each year cadets experience a different aspect of character-based transformational leadership education. This education plan calls for character enrichment in a developmental fashion, beginning with personal understanding, moving to interpersonal skills development, followed by the formation of high-performance teams, and culminating in organizational improvement. Fourth class cadets begin this character development journey by encountering a program called Eagle ACES (Academy Character Enrichment Seminar). This program is a dynamic threehour interactive seminar that focuses on self-reflection. Topics addressed include integrity, establishing personal life assessments, the importance of setting priorities, individual reflection, and finally, establishing a personal life vision. Eagle ACES illustrates to the fourth class cadets the importance of developing a strong personal foundation while further enhancing their own leadership styles. Attendees are exposed to various leadership styles and qualities in the form of popular selected movies, and are then challenged to form their own opinions on how an illustrated ethical situation should have been handled.

The third class cadets complete the Respect and Responsibility (R&R) Workshop. This workshop is designed to take the cadets out of their normal environment and to help them discover valuable information about themselves and others. Students attempt a graduated series of activities, involving both emotional and physical risk, designed around human relations and

diversity issues. The goals and benefits of the R&R Workshop are for participants to acknowledge differences and similarities in their own and others' leadership behaviors; appreciate the impact of respect, cooperation, and trust on problem solving, decision making, and command environment; develop skills that foster and encourage open and honest communication; and to challenge views and biases that undermine a positive and productive command environment.

Second class cadets will take part in the Center's newest offsite seminar - Leaders In Flight Today (LIFT). Building upon the previous character development programs, LIFT includes a personality style assessment tool intended for cadets to better understand others as they better understand themselves. Experiential learning and case studies are employed in team building exercises designed to improve effective communication, interpersonal skills, positive motivation, trust, and team-leadership accountability. A culminating exercise jumpstarts the journey as the cadets are energized to field test the seminar's major insights within their squadrons starting TODAY. Cadet commitment to follow-up and follow-through reflects, in part, leaders of character impacting their own high performance teams.

The cadets' mandatory character and leadership development journey culminates in our firstie program - Capstone ACES. This ACES offsite is a dynamic one-day program designed to focus attendees on the ethical demands placed on Air Force officers. Capstone ACES helps not only the first class cadets, but other staff and faculty examine their collective role in character development within both Academy and the greater Air Force. Attendees are exposed to issues, concepts, and experiences designed to convey the importance of character and leadership development to the positive transformation of the Air Force and the Department of Defense. Participants engage in dialogue throughout the day that focuses upon both ethical development and mentorship skills within the Air Force core value framework.

Our final character development program involves optional cadet participation at the Adventure-based Learning Facility (ABL). The ABL involves a series of high and low ropes course elements which help students develop trust, solve problems, build team unity, and enhance effective communication. Participants receive a bold, discovery-oriented growth opportunity that illustrates the staggering

potential of collaborative effort, team-learning, and organizational synergy.

The Human Relations Division provides formal education in the first two semesters, facilitated by cadet Human Relations Education Officers (HREO). The focus of the lessons is to help develop officers who:



- Believe individual differences of race, color, national origin, religion, and sex are to be valued
- Act in ways which support and encourage others to develop to their fullest potential
- · Do not demean or debase others
- Accept individual differences and understand how they contribute to high productivity and mission accomplishment.

The Human Relations Division manages the cadet HREO program as well. Each cadet squadron has a cadet HREO. The squadron HREOs:

- Responsible to and advises AOC, MTL and cadet squadron commander
- Support all squadron members with human relations concerns
- Performs low-level conflict resolution
- Facilitates M-5 lessons
- Ensure monthly reporting of human relations consults

The fourth division is the Excellence Division. Its key focus is to provide cadets opportunities for practical application of their character and leadership education. This is accomplished primarily through our four largest programs. We annually host the National Character and Leadership Symposium in February of each year. This program brings 40 scholars/experts in the areas of character and leadership together with the cadet wing and visiting university students and faculty from around the globe. The purpose is to share knowledge, expertise, and to continue a scholarly dialogue between cadets and civilian university students. A second program sponsored through the Excellence Division is Falcon Heritage Forum. This semi-annual program brings together one veteran per cadet squadron to shadow 3-4 cadets over a period of 2 days. The veterans attend classes, share their military service with the cadets, and attend athletic events. The event culminates with a formal dinner and keynote address from one of the veterans. Veterans include Medal of Honor recipients and Prisoners of War. A third major program is the Colorado Leadership Alliance. This new Academy program brings university students from 5 other Colorado universities together to dialogue on character and leadership issues. The intent is that each university will host at least one event each year that brings all the universities together for this dialogue. Finally, our last major program is Cadet Service Learning. This cadet led program allows cadets the opportunity to take their character and leadership education into the community. Whether participating in an on-going program like Big Brother/Big Sister or a one time event of building homes for the less fortunate during an Alternative Spring Break project cadets are challenged with many character and leadership dilemmas that must be resolved. In 2001 the Cadet Wing volunteered over 30,000 hours to community service.

In sum, character development will be a crucial, all encompassing part of your Academy experience. From the time you enter until graduation, you can expect to see various character development programs in every aspect of your life with the ultimate goal of imbuing you with the inner desire to put *integrity first*, place *service before self*, and strive for *excellence in all you do*.

Cadet Counseling and Leadership Development Center

Each year approximately 20% to 25% of the Cadet Wing uses the services offered by the Dean of the Faculty Cadet Counseling and Leadership Development Center. The primary goals of this Center are to help cadets remove obstacles to their personal and professional effectiveness and provide them with the skills necessary to succeed at the Academy and throughout life. The internationally accredited Center combines the types of service provided at major colleges and universities with the services unique to a federal military academy in order to meet the full range of cadet needs. Consequently, the staff is able to help cadets with the kinds of problems experienced by many college students (e.g., relationship issues, stress, grief, adjustment to college and military life, depression, anxiety, self-esteem issues) as well as the unique challenges of a demanding military institution (e.g., time management, teamwork, communication skills, impression management, conflict resolution). The comprehensive services range from assistance in selecting an academic major and developing career choices to dealing with eating problems, resolving childhood abuse, and surviving sexual assault experiences. Education and intervention programs for alcohol use/misuse are routinely provided. Virtually every cadet who uses the Center reports that their counselor was concerned with helping them and 90% indicated they were satisfied with the services they received.

The Cadet Counseling and Leadership Development Center takes great pride in the availability of services to cadets. In addition to having unlimited use of counseling and leadership resources, there is no "waiting list" at the Academy. Cadets receive an appointment within three duty days of their request. The Center staff is comprised of doctoral and master's level counselors and leadership consultants, well versed in the developmental, personal, and military needs of the young men and women at the Academy. The staff is committed to the ethical obligation to serve the welfare of each person while preserving their dignity and respect. Thus, the Center is a capable resource whose fundamental purpose is to serve cadets and help them realize their potential.

COMMANDANT OF CADETS:

Brig Gen Johnny A. Weida – MA, Golden Gate University

Vice Commandant of Cadets

Col. Debra D. Gray - MA, Naval War College

Superintendent CMSgt Donna M. Speer – BS, University of Maryland

34th Training Group

Commander
Col Clada A. Monteith – MS, Golden Gate University

Deputy Commander

Lt Col Robyn M. King – PhD, Walden University

Superintendent CMSgt Tim Bruce – AA, Community College of the Air Force

Group 1 Staff and Air Officers Commanding (AOC):

Lt Col Daniel C. Blaettler – MBA, New Mexico Highlands University Lt Col Allen B. Cornelius – MA, University of Colorado, Colorado Springs Maj John P. Durnford – MA, Webster University

Maj Charles R. Timmermeyer – BS Lousiana State University Maj Kenneth C. Ragsdale – MA, Webster University Capt John C. Ayres – BS, United States Air Force Academy

Capt Daniel D. Garber – MA, Webster University
Capt Roy A. Jones III – MA, University of Colorado, Colorado Springs
Capt Trent C. Tuthill – MA, Webster University
Capt Eric Ujfalusy – MBSA, Webster University
Capt Eric Ujfalusy – MBSA, Webster University

Group 1 Superintendent
MSgt Carl Toth – AA, Community College of the Air Force

Squadron 1-9 Military Training Leaders (MTL)

Squarron 1-9 Military Training Leaders (MTL)
TSgt Enrique Pacheco
TSgt Roy K. Christman – AA, Community College of the Air Force
TSgt Michael D. Roos – AAS, Community College of the Air Force
TSgt Brian B. Butler – AAS, Community College of the Air Force

TSgt Norman G. Hewett

TSgt Frik Blatnik SSgt Denise J. O'Connor SSgt Tracey Blackburn

Group 2 Staff and Air Officers Commanding(AOC): Lt Col James J. Hammes III – MA, Air University

Maj Chris Heslin – MBA, Webster University
Maj Ezekiel T. Isais – MA, University of Colorado, Colorado Springs
Maj David H. Jones – BS, United States Air Force Academy

Maj Tony Kaufman – MA, Webster University Maj Scott A. Rose – MA, University of Phoenix Maj Ramona D. Younghanse – MA, University of Central Michigan

Capt William Coker – MA, Long Island University Capt James R. Kafer – MA, University of Colorado, Colorado Springs Capt W. Clarke Pleasants – MS, Embry-Riddle Aeronautical University

Group 2 Superintendent
MSgt Ryan L. Gates – AA, Community College of the Air Force

Squadron 10-18 Military Training Advisors (MTA)
SSgt Jennifer L. Isom – BS, Park University
TSgt Ronald Burke – AA, Community College of the Air Force

SSgt Chris Hilton SSgt Eric C. Bodden

TSgt Audrey Ray

TSgt Dale Ryles SSgt Richard T. Lucio

SSgt Shawn Wright

SSgt Dee Gullickson

Group 3 Staff and Air Officers Commanding (AOC):
Lt Col James M. Gallagher – MA, University of Hawaii
Maj Gregory Bennett – MA, University of Colorado, Colorado Springs
Maj John Bernhart – MBSA, George Mason University
Maj Gary Foster – PhD, Ohio State University
Maj Rusty Meyer – MA, Webster University
Maj Patrick Sullivan – MS, Embry-Riddle Aeronautical University
Maj James Rickman – MS, North Carolina State University
Capt Tony Castillo – MA, Webster University
Capt Jones – MS, Southern Illinois University
Capt Jeffrey B. Shores – MS, Lesley College
Capt Ray Taylor – MA, George Washington University

Group 3 Superintendent MSgt Tisha Stone – BS, Wayland Baptist University

Squadron 19-27 Military Training Advisors (MTA) TSgt Carlos Paine – BS, University of Nevada, Las Vegas TSgt Danielle L. Mackey

TSgt William Armagost

TSgt Michael Joseph SSgt Sean Kreps

TSgt Brenda Hanson

SSgt Bryan Daniel TSgt Mark Fowler

Group 4 Staff and Air Officers Commanding (AOC): Lt Col James D. Harden – MS, Naval Postgraduate School Maj John F. Brower – MS, University of Arkansas Maj Sean R. Herr – MBA, Chapman University Maj Glenn P. Mays – MA, University of Colorado, Colorado Springs

Maj Michael T. Ovard - BS, Brigham Young University

Maj Edward W. Swanson – BA, Nignain Toling Onversity
Maj Edward W. Swanson – BA, Virginia Military Institute
Maj Glenn K. Takabayashi – BS, United States Naval Academy
Maj Alex V. Torres – MBA, Boston University
Capt Charles L. Ford – MS, Troy State University
Capt Mark A Stephens – BS, United States Air Force Academy
Capt Kevin M. Virts – BS, United States Air Force Academy

Group 4 Superintendent
MSgt Ralph E. Presbrey – BS, National-Louis University

Squadron 28-36 Military Training Advisors (MTA)
TSgt James B. Davis – AA, Community College of the Air Force
TSgt Karen D. Donels – AAS, Community College of the Air Force TSgt Joanne Eisenhuth

TSgt Gordon Fay – AA, Community College of the Air Force TSgt Mark G. Fleming

TSgt Mari A. Hazelwood

TSgt Michael R. Lantz – AA, Community College of the Air Force TSgt George A. Poli – AA, Community College of the Air Force TSgt Mark J. Steiner – AAS, Community College of the Air Force

34th Training Squadron

Commander

Lt Col Bill Conn – MS, University of Wisconsin Maj Patrick Lorzing – MA, University of Colorado Mr. Bob Diehl – BAS, Southwest Texas State University

Maj Mike Meyer – MAS, Embry-Riddle Aeronautical University Maj Ben Thielhorn – MAS, Embry-Riddle Aeronautical University Capt Chris Florek – MA, University of Oklahoma

Capt Capt Shayna Michael – MS, Webster University
SMSgt Shelley Bailey – AA, Community College of the Air Force
SMSgt William Welch – AA, Community College of the Air Force
MSgt Paul Knox – BS, Southern Illinois University
MSgt Rodney Timby – AAS, Community College of the Air Force
MSgt Tamara Olon – AAS, Community College of the Air Force

TSgt Sean Andrews TSgt Reginald Clement

TSgt John Coleman
TSgt John Coleman
TSgt John Coleman
TSgt R.C.Delano – AA, Community College of the Air Force
TSgt Michael McCoy – AA, Community College of the Air Force
SSgt Rob Graham – AA, Community College of the Air Force
SSgt Derek Bruns – AA, Community College of the Air Force
SSgt Rusty E, Hayes

SSgt Dan Martin – AA, Community College of the Air Force SSgt Erskin McMickle SSgt James Richardson– AA, Community College of the Air Force

34th Support Division

Director

Mrs. Sharon Gann - MS, Central Michigan University

Deputy to the Director Lt Col David L. Bjornson – MPA, Southern Illinois University

Advanced Information Technology Mr. Barry Harbor - AA, Community College of the Air Force

34th Logistics Squadron

Commander
Lt Col David L. Bjornson – MPA, Southern Illinois University, Edwardsville

34th Services Squadron

Director

Mr. Bill DeCoux – BS, University of South Alabama

Center for Character Development

Director

Col Mark A. Hyatt - MPA, Arizona State University

Deputy Director Mr. Thomas J. Berry, Jr. – MPA, Golden Gate University

Coors Chair Dr. William H. Hendrix – PhD, Purdue University

Professor Emeritus

Mr. Malham M. Wakin (BGen USAF, Ret) - PhD, University of Southern California

Director of StaffMaj John A. Armour – MA, Oklahoma University

Character and Leadership Division
Maj Cheryl A. Soat, Chief – MA, St Mary's University

Mai Steven A. Schaick, Chaplain - MDiv, McCormick Theological

Maj Mark A. Tarnow - MS, Embry-Riddle Aeronautical University Dr. William H. Gibson - PhD, University of Texas, Austin

Honor Division

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Lt Col Ron V. Watkins - MA, New Orleans Baptist Theological Seminary TSgt Todd P. Thomas

SSgt Todd A. Vassar

Dr. Frederick V. Malmstrom - PhD, Oklahoma State University (Visiting Scholar)

Human Relations Division Lt Col Timothy Harris, – MA, Webster University Maj Eduardo C. dela Peña – BS, United States Air Force Academy MSgt J Gary Adcox - EdM, Boston University

Curriculum and Research Division

Maj Daniel J. Miller, Jr., - DM, Colorado Technical University

Maj Patrick J. Knowlton - BS United States Air Force Academy

Capt Shane B. Coyne - MPA, University of Colorado, Colorado Springs Mr. Brent D. Ambuehl - MBA, University of Phoenix

MSgt Craig M. Sowder - AAS, Community College of the Air Force

Dr. Earl W. Brewster - DPA, University of Alabama

Mr. William A. Farrow - BS, Colorado Christian University

34th Education Group

Commander and Permanent Professor

Colonel Thomas A. Drohan - PhD, Princeton University

Deputy Commander Lt Col Richard Walker – MAS, School of Advanced Airpower Studies

Group Executive Officer and Assistant Professor

Maj Jay Billups - MS, University of Colorado, Colorado Springs

Chief, Curriculum Development Mrs. Dolores Karolick – MA, University of Northern Colorado

34th Education Squadron

Commander and Assistant Professor

Lt Col Duke Hazdra, - School of Advanced Airpower Studies

Director of Operations and Assistant Professor Lt Col Judd Jusell – MA, Liberty University

Division Chief – Forces Integration

Mai Robert Melton - MA, Naval Postgraduate School

Division Chief - Strategic Studies

Lt Col Jeffrey Ryan - MS, Southwest Texas State University

Division Chief- Military Power Lt Col Phil Austin – MA, Webster University

CPT (USA) Mary Bell – MA, St. Mary's University Dr. William Berry – PhD, Cornell University

Sq Ldr Andrew Gray – MA, Joint Services Command & Staff College Maj Robert Melton – MA, Naval Post-Graduate School Maj Christopher Rogers – MS, Mississippi State University

Instructors

Instructors

Maj John Benjamin – MA, Webster University
Maj Charles Dusch – MS, University of Arkansas
Dr. John Farquhar – PhD, Ohio State University
Capt James Harty – MA, University of Oklahoma
Maj Chris Luedtke – PhD, Florida State University
Capt Brett Mers – MS, Southwest Missouri State University
Maj John Modinger – MA, University of New Orleans
Lt Col Fred Mohr – MA, Naval Post-Graduate School
Maj Clyde Nelson – MBA, Wilmington College
Maj Clark Peterson – MA, University of Oklahoma
Capt Marcia Smith – MS, Lesley College

50th Education Squadron

Commander and Assistant Professor Lt Col Michael McInerney – MBA, Golden Gate University

Director of Operations

Maj Kevin Taliaferro - MS, Embry-Riddle Aeronautical University

Division Chief - Space Warfare

Maj Mark Salas – MBA, University of Wyoming

Division Chief - Air Warfare

Maj William Pearson - MAS, Embry-Riddle Aeronautical University

Division Chief - Security Applications

LCDR (USN) Joseph Fanning - MS, Auburn University, Montgomery

Executive Officer

Maj Kevin Lee - MA, California State University, San Bernardino

Course Directors

Lt Col Billy Burrows - MAS, Embry-Riddle Aeronautical University

Lt Col Charles Nicholls - MS, University of Southern California

Maj Scott Browning - BA, University of Florida

Maj Lisa Mase - MBA, Campbell University North Carolina

Maj Bill Pearson - MAS, Embry-Riddle Aeronautical University

Lt Col Mark Dotson - MS, Embry-Riddle Aeronautical University

Lt Col Donald Seale – MS, Canberra University, Australia

MAJ(USA)George Hart - MS, University of Southern California

Maj Mark Salas - BS, Citadel

Maj Rick White - MS, Old Dominion University

CPT (USA) Charlie Kim – MBA, University of Hawaii Capt David Woolever – MAEd, East Carolina University

Dr. Glenn L. Ferguson - PhD, Florida State University

Mr. James Schlagheck - MA, Naval War College

Center for Multimedia

Mr. Mickey D. Schmidt - MA, Adams State University

TSgt Vito Logiudice - AA, Community College of the Air Force

Simulator Support Mr. Michael Drew

Mr. Don Smith

34th Operations Group

Colonel Brian T. Bishop, - MA, Oklahoma CityUniversity

Deputy Commander

Lt Col Joseph G. Pacheco - MAS, Embry-Riddle Aeronautical

University

Stan/Eval Division Maj Sean F. Masin - BS, The University of Toledo

34th Operations Support Squadron

Commander

Lt Col Ron Powell - MS, Chapman University

Operations Officer

Lt Col John S. Tomjack- MS, University of Arkansas

Airfield Operations Flight

Mr. Gregorio Treviso - BA, Park College

94th Flying Training Squadron

Commander

Lt Col Hal Hoxie - MA, University of Northern Colorado

Operations Officer

Lt Col Phillip Beaudoin - MA, Embry-Riddle Aeronautical University

98th Flying Training Sauadron Commander

Lt Col Robert A. Nissen- MS, Philips University

Operations Officer

Maj Darin Defendorf - MA, Embry-Riddle AeronauticalUniversity

557th Flying Training Squadron (Air Education and Training

Commander Lt Col Kathleen T. Doby -MS, Embry-Riddle Aeronautical University

Operations Officer

Maj Kevin Mastin - MAS, Embry-Riddle Aeronautical University

AIRMANSHIP (Armnshp)

Offered by the 34th Operations Group

Armnshp 251. Soar For All. Ground school, sailplane flight training.

Armshp 450. Airplane Rating, Private. Dual and solo flight training to complete the requirements for an FAA Private Pilot Certificate. This training is conducted at the USAFA Aero Club at the cadet's expense (some subsidy is available from the Cadet Aviation Club). No formal course enrollment.

Armshp 460. Airplane Rating, Commercial. Dual and solo flight training to complete the requirements for an FAA Commercial Pilot Certificate. This training is conducted at the USAFA Aero Club at the cadet's expense (some subsidy is available from the Cadet Aviation Club). No formal course enrollment.

Armnshp 461. Glider Instructor Upgrade Program. Ground school, dual and solo flight training towards USAFA Sailplane Instructor Rating.

Armnshp 465. Precision Flight Training. Selected cadets receive training in order to be upgraded to Mission Pilot status in Flying Team C-150 aircraft. Training is comprised of a nine sortie upgrade syllabus flown by qualified instructor pilots. A military check ride is given at the end of the syllabus. Upon successful completion of the check ride, the cadets are qualified to act as pilot-in-command of team aircraft. Specific areas of training include landing, area maneuvers, crosscountry navigation, and FAA pattern and local procedures. Through interactions with officers in a daily training environment, the cadets learn the concept of military flying, including the training standards and requirements expected during Undergraduate Flying Training (UFT). Once cadets complete the upgrade program, they will begin training for participation in National Intercollegiate Flying Association competitions held throughout the United States.

Armnshp 470. Airplane Rating, Instrument. Dual flight instruction to complete the requirements for an FAA Instrument Pilot Rating. This training is conducted at the USAFA Aero Club at the cadet's expense (some subsidy is available from the Cadet Aviation Club). No formal course enrollment.

Armshp 472. Soaring Instructor. Selected cadets serve as instructors in Airmanship 251. Completion during summer fulfills a military training leadership option. (Cadets performing Cadet Soaring Instructor Duty will not be eligible to perform Aviation Instructor Duty except by written permission of 94 FTS and 50 TS.)

Armnshp 473. Cadet Soaring Instructor Duty. Selected cadets serve as instructors in Airmanship 461. (Cadets performing Cadet Soaring Instructor Duty will not be eligible to perform Aviation Instructor Duty except by written permission of 34 OSS/DOTS and 50 TS.) Training is conducted during M5 or T5 until evening meal and on weekends.

Armshp 474. Cross-country and Competition Soaring Training. Selected cadets receive training in soaring cross-country navigation, flight planning, thermalling, as well as off-field and precision landings. Qualified cadets will participate in a number of regional and national contests throughout the year. Cadets must compete in a selection process established by the 94 FTS.

Armnshp 475. Spin, Aerobatic, and Demonstration Soaring Training. Selected cadets receive training in spin instruction, advanced aerobatics, and precision flight maneuvers for competition and airshow demonstrations. Qualified cadets will participate in regional and national competitions, and will perform at various airshows throughout the year. Cadets must compete in a selection process established by the 94 FTS.

Armnshp 480. Airplane Rating, Flight Instructor.

Dual flight training to complete the requirements for an FAA Flight Instructor, Airplane Rating. This training is conducted at the USAFA Aero Club at the cadet's expense (some subsidy is available from the Cadet Aviation Club). No formal course enrollment.

Armnshp 490. Basic Free Fall Parachuting.

Instruction in basic free fall parachuting. Successful completion results in award of basic parachutist rating and badge as well as enhanced character development, confidence, and self-esteem.

Armshp 491. Advanced Parachute Training. Ground and aerial training which allows cadets to progress from initial free fall qualification to advanced free fall techniques, controlled body maneuvers, and precision landings. Introduction to instructional techniques, jumpmaster qualification, competitive parachuting and continued emphasis on character development, confidence, and self-esteem. Cadets must compete in a selection process established by the 98 FTS.

Armnshp 492. Jumpmaster/Instructor Training.

Trains selected cadets as jumpmaster/instructors for Armnshp 490. Instructional techniques and jumpmaster qualification. Aerial training consists of proficiency jumps; ground training consists of instruction on inspection, packing, and maintenance of advanced parachutes, and the building of character development, confidence, and self-esteem in other cadets.

Armnshp 496. Cadet Parachute Instructor Duty.

Selected cadets who wish to serve as instructors and jumpmasters for Armnshp 490 and upgrade courses. Cadets participate in competitive parachuting events and parachute demonstrations. Practical leadership laboratory and enhancement of character/leadership qualities in second- and first-class cadets. Cadets who satisfactorily complete Armnshp 491/492 and successfully compete in a selection process established by the 98 FTS are enrolled in Armshp 496 and become members of the "Wings of Blue" parachute team.

Armnshp 753. Introductory Flight Training.

Includes ground training, and dual and solo flight training in single engine aircraft. Required course for all qualified first-class cadets who volunteer to attend USAF Undergraduate Pilot Training (UPT). Results in a FAA Private Pilot Certificate.

AVIATION

Administered by the 50th Education Squadron

AV 395. Aerospace Combat Operations. Provides an introductory exposure to combat operations, including the roles, missions, and comparisons of combat aircraft, combat aircrew member responsibilities, air-to-air operations, and air-to-surface operations. Cadets receive an overall orientation to fighter intercepts, basic fighter maneuvers, bombing, tactics, and low-level flight procedures.

AV 449. Private Pilot Ground School. Ground school to prepare cadets for the FAA Private Pilot written (computer-based) examination. This course is the academic phase of the Introductory Flight Training (IFT) program.

AV 469. Instrument Ground School. Ground school to prepare cadets for the FAA Instrument pilot written (computer-based) examination.

AV 493. Aviation Instructor Training. Selected cadets upgrade to become flight simulator and assistant academic instructors in select aviation and military strategic studies courses. Provides advanced instruction and training in aviation principles and techniques associated with effective instruction. Requires course director approval.

AV 495. Special Topics in Aviation. Selected special topics in aviation.

AV 498. Cadet Aviation Instructor Duty. This course will qualify cadets to assist instruction in MSS 111 and Project Fledgling, teach and maintain proficiency in T-37 and AFT flight simulators, and provide extra instruction in additional 34th EDG courses. Additionally, cadets will be checked out as instructors in the T-41 TACAV program. Cadets gain first hand knowledge of Air Force current operations on field trip to an operational Air Force base.

AV 499. Independent Research and Study. Individual study and research in aviation under the direction and supervision of a 50th Education Squadron academic instructor.

MILITARY STRATEGIC STUDIES (MSS)

Offered by the 34th Education Group. Administered by 34th Education Squadron and 50th Education Squadron

The MSS Major

You begin your path toward a Military Strategic Studies major with a solid theoretical foundation of seven courses: classical military thought, war and morality, military geography, civil-military relations, national security, contemporary military strategy, and airpower. Next, you select a course in the applied technology of warfare (information or physics) and a course in space studies (operations, history, politics, or physics). Then you choose an analytical methods course (political science or historiography). At this point you may elect to use the remaining five courses in the major to pursue a concentration in either strategy and doctrine, or aerospace operations. Or you may build your own emphasis by choosing from a menu of military-oriented courses in aviation, airmanship, history of warfare, security politics, strategic management, international law, air and space law, geography and weather, remote sensing and imagery analysis, leadership, human factors engineering, aerospace physiology, spacecraft engineering, or even space chemistry. Whichever path of advanced study and research you decide to take, the MSS major strengthens your military problem-solving skills and directly prepares you to excel in our vital Air Force mission: to defend the United States and protect its interests through aerospace power.

MSS 100: Military Theory and Air & Space. Examines the strategic context for the military professional, analyzes key military theoretical concepts, and applies Air Force doctrine in war gaming scenarios that reinforce the importance of effects-based targeting strategies in achieving national and warfighting objectives.

MSS 311/311H: Foundations of Aerospace Power. Examines concepts of aerospace power, theory, doctrine, and strategy. Case studies and an employment exercise illustrate relationships among theory, doctrine, strategy, force structure, and military operations

MSS 365: Developing the Military Strategist. Cadets will develop a working knowledge of the issues and applications associated with advanced military theory and strategy. This course will be comprised of critical information currently found in MSS 460 and MSS 470 and replace those courses on the required course list for MSS majors.

MSS 383: Aerospace Strategy & Instructor Qualification. Select cadets will be immersed in academically rigorous and professionally relevant aerospace theory and doctrine, and through principle and practice, mature into aerospace instructors capable of applying and validating intellectual concepts associated with the exploitation of future

battlespace. Cadets explore doctrinally relevant case studies which correlate to significant operational and strategic ramifications. In conjunction with academic exploration, these cadets learn to instill in others aerospace concepts using a T-41 Airborne Conceptual Application and Validation (TACAV) laboratory, T-37 jet flight simulators, vertigo induction apparatuses, computer based aviation flight training devices, and the Academy planetarium. Cadets are directly exposed to joint operational and strategic applications in the course of guest speakers, and field trips to nearby Air Force and Army installations.

MSS 385. Information Warfare. Discusses information dominance as it relates to achieving military success. Examines information as a means to control and exploit the mediums of air and space by exploring command, control, communications, computers, intelligence systems, electronic warfare, and space operations. Analyzes the synergistic potential of these systems to enhance warfighting capability and innovation to defeat an adversary. Assesses the influence of these systems on force structure, strategy and doctrine.

MSS 395. Aerospace Combat Operations. This course examines the employment of combat aviation strategy, doctrine, and tactics in combat operations supporting US national defense objectives. Studies include a comparison of the roles, missions, and capabilities of US and allied combat aircraft, combat aircrew duties, air-to-air and air-to-ground operations, space operations, combat support assets, and the planning skills required of mission planning Global Attack operations. Cadets develop, plan, and brief a comprehensive combat mission scenario using accepted military briefing procedures.

MSS 411/411H. Introduction to Joint and Multinational Operations. Examines joint U.S. military doctrine and employment concepts. Cadets relate the basic doctrines of all U.S. services to current crisis situations and employment concepts. Case studies of military operations are used to illustrate course concepts. A crisis exercise is utilized to apply these concepts in a simulated joint conflict.

MSS 386. Air and Space Power and Information Operations. Examines key concepts of military theorists and of air and space theory and doctrine. In addition, seminar participants will explore the doctrine and strategy of information operations (IO) and the associated Air Force core competency of Information Superiority. Case studies and an employment exercise illustrate the relationships between doctrine, strategy, force structure, command relationships, training, and combat operations. Students will also be introduced to joint IO doctrine, the concept of Information Dominance, and its role in Joint Vision 2010.

MSS 468. Introduction to Modern Aerospace Weapons. This course examines the tactical employment of combat aviation strategy, doctrine, and tactics in support of Joint/Combined Force Air Component Commanders. Studies include

capabilities of US combat aircraft, combat support assets, space operations, Air Tasking Orders (ATOs), and planning skills required to build a strike package for Global Attack missions. Cadets develop, plan, and brief a comprehensive tactical strike mission using current Air Force procedures.

MSS 470. Comparative Air Power. Compares and contrasts the doctrine, strategy, structure, and employment characteristics of selected US (e.g., Air Force and Navy) and foreign (e.g., British and Israeli) air forces. Analyzes the rationales for differences in doctrines and force structures, and evaluates implications for joint and multinational operations

MSS 481. Principles and Practice in Air and Space *Warfare.* This course examines the relationship between new technology associated with modern air and space platforms and operational and strategic objectives. Cadets will gain a broad appreciation of the benefits, and healthy respect for the challenges, associated with the three-dimensional exploitation of hostile air and space environments, and how these variables impact battlespace exploitation throughout the spectrum of conflict. Aerospace technology such as cockpit instrumentation, satellite and land-based navigation and positioning receivers, and night optical devices are matched with the warfighter's integration of capabilities and limitations. Hands-on experience and application of these concepts are explored through computer based aviation flight training devices, T-37 flight simulators, vertigo induction apparatuses, and the Academy planetarium.

MSS 483: Specialized Applications & Aerospace Strategy. Cadet Aerospace Instructors continue their deep immersion in academically rigorous and professionally relevant aerospace theory and doctrine, and in servicing a number of educational demonstrate the application and validation of concepts associated with the exploitation of future battlespace. MSS 483 Cadet Aerospace Instructors periodically lead combined seminars to generate debate and analysis of complex scenarios involving role-playing among first degree leadership, second degree followers, and professional military and civilian instructors – all exploring doctrine, strategy, operational art, and aerospace power using multiple senses. Cadets are directly exposed to joint operational and strategic applications in the course of guest speakers, and field trips to nearby US Air Force and Army installations. Finally, Cadet Aerospace Instructors, enrolled in SAAS, frequently interact with visiting dignitaries such as congressional delegations, high school and university counselors, PhDs, and General Officers.

MSS 485: Space Operations and the Warfighter. Examines the employment of space power strategy, doctrine, and tactics supporting U.S. national defense objectives. Studies include the evolution of military space missions, current space force structure, introductions to space law and orbital mechanics, military space doctrine, and an emphasis on the application of spacepower roles. Experience in the capabilities of space assets first-hand. Research and briefing of an emerging space issue.

MSS **495**. *Special Topics*. Selected topics pertaining to the military profession.

MSS 499. Independent Study. Individual study and/or research under the direction of a 34th Education Group instructor.

MILITARY TRAINING (Mil Tng)

Offered by the 34th Training Group–exceptions noted under course descriptions.

Mil Tng 100. Basic Cadet Training (BCT). A 38 day transition period from civilian to military life. Indoctrination in the overall Academy program, cadet regulations, the Honor Code, manual of arms, drill, customs and courtesies, and other general military subjects. Introduction to basic Air Force weapons, firing the M-16 rifle and the M-9 pistol; and a field encampment.

Mil Tng 220. Combat Survival Training (CST). Three-week Basic Aircrew Survival Training program of approximately two weeks on-base training covering global aspects of survival and Code of Conduct and approximately one week of field training.

Mil Tng 260. Global Engagement (GE). A nine-day Air Expeditionary Force deployment, employment and redeployment covering bare base bed down concepts, exposure to several support and operational career fields.

Mil Tng 301. Operation Air Force Program. Conducted at selected Air Force bases. Provides exposure to an operational Air Force unit and the functions of airmen, NCOs, and junior officers.

Mil Tng 302. Specialized Navy Training (MiniBuds). First- and second-class cadets volunteering for various Navy training courses. Programs are 2-3 weeks in length.

Mil Tng 304. Specialized Army Training (Air Assault). First- and second-class cadets volunteering for various Army training courses. Programs are 2-3 weeks in length.

Mil Tng 305. Specialized Marine Training (Bulldog). First- and second-class cadets volunteering for various Navy training courses. Programs are 2-3 weeks in length.

Mil Tng 306. BSA Philmont. Positions at Philmont Scout Ranch in Cimarron, New Mexico, as rangers or instructors in the staff camp areas.

Mil Tng 307. Composite Group Duty. Selected thirdclass cadets will be scheduled into Composite Group Duty positions. These cadets assist upper-class cadets in manning the Composite Group program (Mil Tng 407).

Mil Tng 309. KAFA Radio Station. Manage and perform programming for the Academy radio station.

Mil Tng 310. KAFA Radio Station Cadet in Charge (CIC). First-class cadet selected for CIC duty. This program receives leadership credit.

Mil Tng 311. Global Engagement Cadre. First- and second-class cadets selected for leadership positions for Global Engagement (Mil Tng 260). Act as command and control element during deployment, employment and redeployment.

Mil Tng 332. Summer Seminar. Cadets serve as counselors and escorts for approximately 450 high school seniors from all 50 states. During the two one-week sessions, the high school students are housed in Vandenberg Hall, attend workshops, tour the Academy and surrounding areas, participate in recreational sports, and attend various evening programs. Qualified cadets will help with some of the workshops.

Mil Tng 333. Summer Seminar Cadet in Charge (CIC). First- and second-class cadets selected for CIC duty for the Summer Seminar program (Mil Tng 332). CIC is in charge of other cadets assigned to the Summer Seminar program, overseeing all activities in which cadets and students are involved. Serves as liaison between cadets, students, and project officer.

Mil Tng 351. Operation Civil Engineering Air Force Cadet in Charge (CIC). For first-class cadets selected for CIC duty for the OPSCE AF Program (Civ Eng 351).

Mil Tng 352. Basic Airborne Training. Conducted at the US Army Infantry School, Fort Benning, Georgia. Includes basic skills of static line parachute jumping. Cadets who have successfully completed Airmanship 490, Free Fall Parachuting, will not be allowed to enroll in Airborne Training.

Mil Tng 402. BCT Cadre. Leadership positions as instructors, officers, or NCOs in the cadet chain of command during BCT (Mil Tng 100). Administered by the Deputy Commandant for the Cadet Wing and the 34th Education Group.

Mil Tng 406. BSA Philmont Cadet in Charge (CIC). First- and second-class cadets selected for CIC duty for the BSA Philmont Program (Mil Tng 306).

Mil Tng 407. Composite Group Leadership Duty. Cadet officer and NCO leadership positions maintaining command, control, and accountability and providing billeting for all cadets taking summer academic courses and transient cadets using cadet area facilities. Administered by the Deputy Commandant for the Cadet Wing.

Mil Tng 408. Sports Camp. First- and second-class cadets accepted by the Athletic Department program manager to work sports camps for one period during the summer.



Mil Tng 411. Air Education Training Command Leadership Duty (AETC Leadership). Leadership positions with a Basic Military Training Squadron at Lackland AFB, Texas, as assistants to squadron commanders and as basic airmen training instructors and counselors.

Mil Tng 412. Falcon Mascot. Train recently hatched falcons for upcoming football season performances, training of falcons on hand, public relations work, and assist in renovations/repairs of mews and equipment. Only cadet falconers are eligible.

Mil Tng 413. Sports Camp Cadet in Charge (CIC). For first-class cadets selected for CIC duty for the Sports Camp Program.

Mil Tng 415. Commanders Leadership Planning Period. Planning and seminar session for cadets selected for Cadet Wing Commander, Vice Commander, Deputy Commander/Operations, Wing Superintendent, Group Commander, Group Superintendent, Squadron Commander, and Intercollegiate Team Captain positions.

Mil Tng 416. BCT Committee-CATM Unit. Selected first- and second-class cadets work as teams with professional NCO weapons experts to familiarize all basic cadets with fundamental use and care of the M-16 rifle and M-9 pistol.

Mil Tng 420. Combat Survival Training (CST) Cadre. Leadership positions as instructors, officers, or NCOs in the cadet chain of command for the CST program.

Mil Tng 421. CST Student/Cadre. First- and secondclass cadets directed by the Summer Training Review Committee to repeat part of CST Student during their CST Cadre military training. Cadets are assigned to CST Student to make up incomplete training, and then revert back to CST Cadre status.

Mil Tng 422. CST Student/Leave. First- and secondclass cadets directed by the Summer Training Review Committee to repeat part of CST Student during their leave time. Cadets are assigned to CST Student to make up incomplete training, and then revert back to leave status.

Mil Tng 423. CST Student/Composite Group Leadership Training. First- and second-class cadets directed by the Summer Training Review Committee to repeat part of CST Student during Composite Group training. Cadets are assigned to CST Student to make up incomplete training, then revert back to Composite Group Leadership Training.

Mil Tng 438. Operation Civil Engineering. Firstclass cadets spend first training period at a government facility working on a project in the civil engineering field. Cadets are selected by the Civil Engineering Department for this program.

Mil Tng 439. Summer Research. First-class cadets spend 38 days at a government research facility working on a project, usually in their major's area. Summer Research participants will be scheduled for a third training period leadership program. Cadets must be selected by their major's department for this program.

Mil Tng 457. BCT Cardiopulmonary Resuscitation (CPR) Course Committee. For first- and second-class cadets who administer CPR training to basic cadets.

Mil Tng 458. BCT Leadership Reaction Course Committee. For first- and second-class cadets who administer the Leadership Reaction Course to basic cadets.



Mil Tng 491. Astronomy Operations. One to three selected cadets will be accepted for military training at the Academy Planetarium and Observatory during each summer session. Interview with an Astronomy Branch instructor is required prior to acceptance. Completion of an astronomy or astronomy-related course at USAFA is recommended.

Mil Tng 492. Planetarium Operations. Cadets who are accepted for military training will receive instruction in planetarium show production and presentation. Students will be required to interact with the visiting public, give presentations, learn the night sky, and become involved with show production.

Mil Tng 495. Special Project. Special training, participation, observation, leadership, and/or instructional programs conducted to fill a temporary or unforeseen need or to test a new program or concept prior to full implementation. Administered by the 34th Training Group Commander.

Mil Tng 498. Kissinger Fellowship. First-class cadets chosen by the Political Science department to participate in the Kissinger Fellowship during any three-week period in the summer. Fellowship may be longer than three-weeks. This course earns military training credit in three-week increments.

Mil Tng 499. Summer Internship Program. Firstclass cadets working special research/internships at various TDY locations or on the Academy. These are individual programs structured for each cadet enrolled. The program may be scheduled for any one of the three summer periods. Examples are the Georgetown and Washington Internship programs.



CADET MILITARY TRAINING (CMT) Offered by the 34th Training Group

CMT 100. Fourth-Class (Freshman) Military Training. Fall semester lessons concentrate on the knowledge required to orient cadets to Academy life. The first block of lessons focuses on the practical aspects of personal responsibilities, time management, and setting and attaining goals. Other lessons stress duty, followership skills, heritage, and honor. During the spring semester, training focuses on the Academy Training Philosophy and operational Air Force. The lessons are designed to help cadets better understand leadership and Air Force organization.



CMT 200. Third-Class (Sophomore) Military Training. Fall semester lessons focus on gaining skills for teaching and mentoring fourth-class cadets. Cadets learn how to properly apply the Academy Training Philosophy, including subordinate leader training. The spring semester focuses on the demonstration-performance method of teaching and preparing the cadets to be supervisors.

CMT 300. Second-Class (Junior) Military Training. Focuses on development of supervisory skills. In the fall semester, cadets analyze operational problems; prepare written corrective actions; and learn delegating, controlling, and problem solving. Spring lessons concentrate on leadership principles. This approach permits cadets to practice and refine these leadership skills in preparation for leadership of the cadet wing and later for leadership in the Air Force as a commissioned officer. Spring semester prepares second-class cadets for their roll as leaders in the cadet wing.

CMT 400. First-Class (Senior) Military Training. The primary goal of the first-class CMT is to make final preparations for commissioning. During their first-class year, cadets will apply leadership skills in running the cadet wing. They will also obtain a working knowledge of the Air Force to include such topics as officer standards, the assignment system, officer finances, duty, and the enlisted evaluation system.



Academics

Graduates of the Air Force must Academy intellectually prepared to assume professional and leadership roles. The academic curriculum offers a balanced sequence of required courses that develops future Air Force officers with innovative, analytical, and resourceful minds. You'll receive a broad education in the basic sciences, engineering, humanities, and the social sciences. The Air Force Academy offers 30 majors and two minors. You'll

take elective courses that suit you and give you a background for possible graduate education during your career.



You receive a computerized progress report at mid-semester and a final report at the end of the semester with your grades.

Semester Schedule

The fall and spring semesters contain approximately 17 weeks of instruction (42 lessons) and they extend from early August to the week before Christmas and the first week in January through mid-May. Each semester includes six days for final examinations. A limited number of academic courses are offered for the third-, second-, and first-class cadets during the Academy's 10-week summer term. Early in BCT, you'll take placement examinations offered by the academic departments. Your individual ability, preparation, and achievement determine what classes you'll take during your first semester.

Grading

Most courses at the Academy are graded on a grade point scale, with an "A" worth four quality points per semester hour, and an "F" worth zero. Quizzes, examinations, and class recitations determine your grades. You'll receive a pass/fail grade in several courses, particularly military training and airmanship. You should normally spend 100 minutes in outside preparation for each 50-minute class period.

Cadet Achievement

A semester 3.0 or greater grade point average (GPA) earns you a place on the Dean's List and you may wear a silver star on your uniform. A silver wreath shows you're on the Commandant's List and have earned a military performance average (MPA) of 3.0 or greater. Cadets who earn a 3.0 or greater grade point physical education average (PEA) are awarded a silver lightning bolt by the Director of Athletics. You may be entitled to wear any two of these awards in combination. If you earn all three, you'll wear a silver star within the wreath surrounded by two lightning bolts to show you're on the Superintendent's List. If you're on any of these lists, you may be awarded additional privileges on weekends.

Deficiency and Disenrollment

You'll be deficient in academic studies at midsemester or the end of a semester if any of the following occur: (1) you have a grade of "F" in one or more courses, (2) you have a controllable incomplete ("I") in one or more courses, or (3) your cumulative, or semester GPA is less than 2.0.



If you're deficient, an Academic Review Committee (ARC) may recommend you repeat or take a specific course during a subsequent semester, underload one course, change academic majors, take a summer class in place of leave, be turned back to the next succeeding class, or take any other action deemed appropriate. The Superintendent will consider the committee's recommendation and make the final decision. If you are seriously deficient, you may face academic disenrollment.

You'll be deficient in military performance if you fail a Professional Competency Exam or if your MPA is below 2.0 at the end of the semester. A Military Review Committee (MRC) evaluates deficient cadets and places them on aptitude probation or starts other corrective action. The committee may recommend that the Academy Board disenroll a cadet seriously deficient in conduct or aptitude for commissioned service.

If you fail one or more items on the Physical Fitness Test (PFT) and have a total score below 250, or if your 1.5-mile aerobics run time is slower than 11:15 (men) or 13:31 (women), you'll be deficient in physical education. You'll also be deficient if you fail any of your physical education instruction. A physical education review committee considers deficient cadets after the final PFT make-up test each semester. The committee may recommend a remedial conditioning program, athletic probation, attendance at a physical education program in place of leave during the summer term, turn back to the next class, or disenrollment.

Academic Core Courses

During your fourth- and third-class years, you'll concentrate on prescribed core courses. Later, you'll take mostly elective courses. The Summary of the Curriculum shows the standard sequence required of most cadets.

Brigadier General David A. Wagie is the eighth Dean of the Faculty. A graduate of the Air Force Academy, Class of 1972, the General has served in Arizona, California, New York, Ohio, Indiana, Alabama, and Colorado. He has held a wide variety of positions—executive officer, instructor pilot, Director of Test Operations for a Flight Test Squadron, Deputy Commandant for Military Instruction, Director of the Academy's Center for Character Development, and instructor, Associate Professor, Permanent Professor, and Vice Dean of the Faculty. The General earned a bachelor of science degree (Distinguished Graduate) from the Air Force Academy, a master's degree in Aeronautics and Astronautics from Stanford University, a master's degree in Systems Management from the University of Southern California, and a doctorate in Aeronautics and Astronautics from Purdue University. He is a Distinguished Graduate of the Squadron Officers School and Air Command and Staff College. General Wagie is a command pilot with over 2,300 flying hours in the T-37, T-38, T-41, T-43, KC-135, EC-135, NKC-135 and C-135. He assumed duties of the Dean of the Faculty in July 1998.



Brigadier General David A. Wagie Dean of the Faculty

"The education of America's future leaders is paramount to our mission. Our primary role as faculty is to provide instruction and experience to all cadets so they graduate with the knowledge, character, and motivation essential to leadership as career officers. Through challenging academic programs, the Academy provides the tools and opportunities to develop the reasoning, communication, and problem-solving skills necessary for our future officers. Equally important is the faculty's responsibility to help cadets develop integrity and character as we motivate them toward military service. Serving as professional role models, Academy instructors—the majority of whom are Air Force officers—combine the finest academic preparation with a wide variety of Air Force skills and specialties to enrich classroom instruction. Through highly personalized academic counseling and student assistance, our faculty and staff are dedicated to providing each cadet with the greatest opportunity for success. For those cadets who excel academically, the Academy offers many postgraduate scholarships to further enhance the young officer's professional development. The faculty is governed by three guiding principles: provide a quality education, promote trust and responsibility, and be a community of airman-scholar-citizens. With this focus, we are able to graduate knowledgeable and motivated cadets committed to integrity, excellence, and selflessness.'

Summary of the Curriculum	1004		1
Class of 2006			
Course Title Academic F	Hours	Course Title Academic	c Hours
FOURTH-CLASS (Freshman)		SECOND CLASS (Junior)	
Summer		Summer	
Basic Cadet Training (BCT)			
Basic Physical Training	100	Military Training Options	
		Operations Air Force Field Trip	
Fall and Spring	9-19		
Applications of Chemistry (Chem 141, 142)	6	Fall and Spring	
Introduction to Computer Science (Comp Sci 110)	3		
Language and Expression (English 111)	3	Introduction to Astronautics (Astro 410)	3
Modern World History (History 101)	3	Electrical Signals and Systems (El Engr 215)	3
Calculus I and II (Math 141/142)	7.5	Energy Systems (depends on major)	3
General Physics I (Physics 110)	3	Law for Commanders (Law 200)	3
Military Theory and Air &Spacepower (MSS 100)	3	Ethics (Philos 310)	3
Physical Education	1.5	Academic Elective Courses	12-18
Fourth Year Experience (Engr 100)	1	Foundations of Aerospace Power (MSS 311)	3
THIRD CLASS (Coultrane)		Physical Education	1.5
THIRD-CLASS (Sophomore) Summer			
Combat Survival Training (CST)			
* Soar for All or Basic Parachuting		FIRST-CLASS (Senior)	
Global Engagement		Summer	
Fall and Spring		Military Training Options	Sil
Fundamentals of Aeronautics (AeroEngr 315)	3	Eall and Spring	
Fundamentals of Mechanics (Engr Mech 120)	3	Fall and Spring	
Introductory Biology w/Lab (Bio 215)	3		
Principles of Microeconomics (Econ 220)	2	Engineering Systems Design (Engr 410)	3
Masterpieces of Literature (English 211)	3	Advanced Composition and Speech (English 411)	3
Introduction to Military History (History 202)	3	Academic Elective Courses	27-30
Introduction to Management (Mgt 200)	2	Joint and Coalition Warfare (MSS 400)	3
Probability and Statistics (Math 300)	3	Physical Education	1
General Physics II (Physics 215) Politics and American Government (Pol Sci 211)			
Geopolitics (Soc Sci 112)	3	* May take during the third-class summer or thi	ird-class
Intro to Behavioral Sciences and Leadership (Beh Sci 100)	3	academic year.	
Air Base Design and Performance (Civ Engr 210)	3		
Soar for All (Armshp 251)	0		
Glider or Parachuting Instruction (Armnshp 472/492)	0/2		
Older of Tarachating Histraction (Arminshp +72/4)2)			

Degree Paths

Several graduation paths are open to you, depending on your abilities and interests. The faculty has 19 departments offering 30 academic majors. There are 20 disciplinary, four divisional, and six interdisciplinary majors.

Divisional and Disciplinary Majors Outlined

We've briefly outlined each major, listing the course sequence. You can find course descriptions throughout this section. As you study these summaries, keep in mind that you must complete all the requirements to major in a subject area. You may change your major if you can meet the new requirements without excessive overloads. If you fulfill all requirements, you may earn more than one major.

Enrichment

Each academic department offers independent study courses for cadets to research individualized topics. You may request special topics or courses covering contemporary issues. Course content is continually updated to stay abreast of current developments. Term papers and laboratory work also offer opportunities to engage in original research.

With approval from the specific department, college credits from other universities can be transferred. If you score well on the AP tests, you may also validate some Academy courses. Some departments administer a test to you once you arrive; earning high marks on the test may enable you to be placed in an accelerated or advanced course, or perhaps receive validation credit and substitute another course.

With a 3.25 GPA, you may overload courses, taking classes beyond the normal semester maximum for wider latitude in your course program planning. Upper-class cadets with a 2.60 GPA may audit a course beyond the normal semester maximum. Upper-class cadets with a 3.25 GPA may overload and audit a course. If a cadet audits a course, attendance is optional, no graded work is accomplished and the audited course does not appear on the transcript.

Exchange Programs

Selected cadets experience the traditions and cultures of foreign countries during spring break exchange visits of 7-10 days with the air force academies of Argentina, Bolivia, Brazil, Chile, Colombia, Egypt, England, Germany, Japan, Jordan, Korea, Peru, Spain, Turkey and Ukraine. Each fall semester a maximum of 24 cadets also participate in a semester exchange program with some of these countries' air force academies, where they experience more extensively the academic,

military, athletic and social activities of the host academy. USAFA's semester exchange with France's Ecole de l'air began in 1969. We began an exchange with the German Offizierschule der Luftwaffe in Fall 1999, with the Chilean Escuela de Aviacion in Fall 2000, with the Spanish Air Force Academy in Fall 2001 and with the Canadian Air Force Academy in 2002. In future years we hope to establish exchanges with Arabic-, Chinese-, and Russian-speaking academies. Also, during the fall semester, a small group of second-class cadets trades places with their counterparts from West Point, Annapolis, and the Coast Guard Academy. This interservice exchange provides a better understanding of the other services and develops some uniformity among programs at the academies.

Graduation Requirements

To graduate you must, a) demonstrate an aptitude for commissioned service and leadership by having a minimum cumulative MPA of 2.00, b) be satisfactory in conduct, c) be proficient in physical education and military training, d) complete the requirements for the core curriculum and for an academic major, and e) have a minimum cumulative and core GPA of 2.00.

Accreditation

The Air Force Academy is a fully accredited institution of higher learning. The Higher Learning Commission, of The North Central Association of Colleges and Schools, 30 N. LaSalle Street, Suite 2400, Chicago, Illinois 60602-2504, phone (312) 263-0456, accredits the standard bachelor of science degree. The aeronautical engineering, astronautical engineering, civil engineering, electrical engineering, engineering mechanics, environmental engineering, and mechanical engineering majors are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, composed of representatives of the major professional engineering societies. The Committee on Professional Training of the American Chemical Society accredits the chemistry, biochemistry and material science majors. The Computing Sciences Accreditation Board accredits the computer science degree, and the Association for the Advancement of Collegiate Schools of Business (AACSB) accredit the management degree. When you complete a major's requirements, you earn the specified degree.

Instructional Methods

The Academy faculty uses lectures, discussions, demonstrations, tutorials, and seminars in teaching. The small size of most classes, usually 15 to 20 cadets, makes the discussions practical and popular. The relaxed classroom atmosphere encourages free communication between the

instructor and cadets. You may also receive extra instruction to develop your understanding of a subject and to improve your grades. Tests range from essay questions and themes to short-answer and multiple-choice items. Quizzes, graded reviews, or final examinations determine your progress.

Directorate of Education

The Directorate of Education is a staff agency that includes; The Center for Educational Excellence, the Institute for National Security Studies, the Institute for Information Technology Applications and the Technical Assistance Center. The purpose of the directorate is to coordinate and facilitate research and to enhance the quality of teaching and learning at the Academy. The Directorate of Education is the primary academic support agency for faculty development, academic assessment, institutional and programmatic accreditation, educational technology integration, and research coordination.

Office of the Registrar

The Office of the Registrar staff administers the entire curriculum, from conducting registration, to certifying you've met all degree and majors requirements, and coordinating the graduation ceremony.

Student Services

The Student Services Center offers courses and individualized instruction designed to increase cadet academic performance. If you want to improve your time management, general study skills, reading rate and comprehension, writing skills, or need tutoring in a specific core course, the Student Services Center staff can help. Information on graduate scholarship opportunities is also available.

Visual Services

Supplemental instruction is available using satellite down link, videotape, and live transmission to classrooms and dormitories. Also available are state-of-the-art interactive media for computer-based instruction, video production support, digital graphic and photographic products, and self-help video origination and editing. A lending facility provides notebook computers, linear/digital projectors, course videotapes, and traditional projection/audio equipment

Classrooms and Laboratories

Most classes are in small classrooms. However, some are in the larger, tiered lecture rooms to allow plenty of interactions between students and instructors. There are also large lecture halls for assemblies. In the aeronautics laboratory, you'll use a subsonic continuous wind tunnel, a trisonic

blowdown tunnel, an F109 high-bypass turbofan engine, a J69 and a J85 operational turbojet engine, a rocket test cell, and internal combustion engines. The turbojet engines, which are flown in the T-37 and T-38 trainer aircraft respectively, let you operate the actual engines flown in pilot training.

The Department of Engineering Mechanics' Applied Mechanics Laboratory is one of the most modern and best-equipped undergraduate labs in the country. It provides a wide array of tools and equipment for hands-on learning for class projects and labs. Cadets are encouraged to learn how to use a variety of wood- and metal-working equipment such as a lathe, computer controlled mill, welding equipment, material testing systems, and composite material fabrication tools. In addition, a separate garage facility, complete with a full-scale chassis dynamometer, provides a unique opportunity for cadets to apply skills learned in their courses: among many other projects, cadets design and fabricate an off-road vehicle and a formula car for national intercollegiate design competitions.

Three astronautics laboratories contain items unique to an undergraduate school. Workstations with digital and analog computers, facilities for small satellite design, fabrication, and testing, rocket design and build-up areas, and high fidelity orbital analysis software support research and classroom activities. Several courses use the Engineering Division laboratory's metal and wood shops and electronic equipment.

The foreign language learning center includes workstations using interactive videodiscs and a sophisticated local-area network. Research and teaching innovations place the Department of Foreign Languages among the national leaders in using leading-edge technologies for foreign language instruction.

Astronomy, navigation, and related academic disciplines use the planetarium for multimedia research and cadet instruction. The instructor simulates many realistic sky effects on the 50-foot hemispherical star theater. Cadets also study astronomy in the Academy observatory using both 24- and 16-inch telescopes configured with state-of-the-art computer controlled drive systems. Cadets learn how astronomers explore the universe by various detectors: two CCD (Charged Coupled Device) photometers, a photoelectric photometer, a CCD spectrograph, and film.

Networked Classroom Laboratory

The Academy's first networked computer laboratory was established in 1992. It supports instructors teaching in any academic area, beta testing of operating systems and application software, and hands-on training for faculty and staff. The lab boasts two remote controlled overhead one gun projectors, two remote controlled

viewing screens, a cable ready VCR, permanent overhead speakers, a overhead projector and a HP 8000 printer. The NCL PC's are upgraded every two years to assure that they are capable of handling new and large software to include AutoCAD, Mechanical Desktop, Mathematica, GIS and even war-gaming software.

The Directorate of Education opened a new common use multimedia laboratory (MML) in January 2000. The lab contains 45 desktop computers, one server, two flatbed/sliding scanners, one regular printer, one color printer, a copier, a one-gun overhead projector, a binding machine, a laminating machine, 15 drops for laptops, a wireless access point and on-site help. This facility is open seven days a week and operates the same hours as the library. We continue to offer on-site help from 7:00 a.m. until 10:30 p.m. and on weekends. The on-site help seems to be the biggest attraction for students. In addition to the hardware, the lab computers contain most of the software applications used by the Academy's academic and military training departments. In addition to convenience and just-in-time help, the MML is the perfect technology testing and research environment. It allows technology professionals and instructors to evaluate and test leading edge educational technology in a controlled environment.

The Academy opened a Distance learning Center (DLC) during the fall 2000 semester. Using state-of-the-art video teleconferencing equipment, the DLC supports a variety of academic courses. Cadets "join" classes at other educational institutions, including other service academies, interact with guest lecturers, and participate in dialogues with students from other colleges and universities. The Center also hosts a variety of administrative meetings, saving Academy personnel both time and travel expenses.

Computers

Continually updated computer equipment means you'll use one of the finest undergraduate computer centers in existence. A local area network connects every dormitory room, faculty and staff office, classroom, and laboratory at the Academy. You'll receive a brand new, sophisticated microcomputer at the start of your fourth-class year, right after BCT. You will use your computer in virtually every class you take at the Air Force Academy. Consequently, typing skills are a necessity, not a luxury. We strongly recommend that you learn to type at least 25 words per minute accurately prior to your arrival. All hardware and software that you use must be identical, so don't buy your own microcomputer before entering the Academy. We'll bill your pay account, so once your account is paid, the system is yours.

Air Force Academy Library

The library serves your academic, research, and recreational reading needs. Professional librarians staff the library 84 hours a week. It maintains over 1.5 million items including: books, national and international journal and newspaper subscriptions, technical reports, an audio collection, and a web page with links to a number of on-line indexes, abstracts, and full-text document services. The library's integrated computer system provides access to library holdings and is accessible from all floors of the library, faculty offices, and cadet rooms. We recently added wireless capability throughout the library, so you can work online from any location you choose using a notebook computer.

The reference collection contains standard and specialized works on most subject areas. We also provide for electronic searching of selected indexes and access to on-line and CD-ROM databases that are available to cadets at no cost. You may use US government and international agency documents in the Academy's Documents Depository. Our special collections include major works in aeronautics and military aviation history as well as other documents and papers from distinguished Air Force and military officers.

The Faculty

The Academy's faculty is composed of approximately 75 percent Air Force officers and 25 percent civilian professors. A few officers from other branches of the US Armed Forces and from allied nations supplement the faculty, as do several distinguished civilian visiting professors.

Unlike most institutions of higher education, the Academy has no graduate students to work as teachers or laboratory assistants. Each faculty member must possess at least a master's degree, and approximately 50 percent have earned doctorates. Ten percent of the faculty hold the academic rank of professor; 18 percent associate professor; 44 percent assistant professor; and 28 percent instructor. Faculty members possess degrees from such outstanding colleges and universities as Harvard, Stanford, Yale, Princeton, Duke, and the Massachusetts Institute of Technology, as well as from foreign universities such as Kings College-University of London and Oxford University in England.

Faculty members maintain close contact with the cadets, and not just in the classroom. They sponsor extracurricular activities and athletics, and they frequently adopt squadrons and attend their special events. Many contribute to the literature and progress in their fields through research projects. All departments use the talents of their best students in their research efforts. During the summer, faculty members often serve as consultants to other Air Force installations.

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Dr. Salif Traaore – PhD, Institute of Ethnology and
Anthropology, Moscow

Dr. Miguel Verano – PhD, University of Texas, Austin Ms. Suzanne E. Cook – MS, University of Southern California

Ms. Yumiko Guajardo – MA, University of Arizona Ms. Haning Zhou Hughes – MA, University of Colorado, Boulder

Mr. Victor W. Nell - MS, Louisiana State University

Instructor

Col Mark Mayhew – MS, University of Southern California Lt Col Marlon Ruiz – MA, Embry-Riddle Aeronautical University

LTC (USA) John Sharp – MA, University of Washington
Lt Col Dave Wilkins – MA, Naval Postgraduate School
Maj Scot Allen – MSE, University of Texas, Austin
Maj Myrna Cronin – MS, St Mary's University
Maj Brian Hill – MS, Washington State University
Maj David H. Marchant – MS, Air Force Institute of Technology
Capt Robert Chambers – MSSI, Joint Military
Intelligence College

Capt Yvonne Fromm – MA, Webster University Capt Rouven Steeves – MA, Naval Postgraduate School Ms. Maha Foster – MA, American University of Beiriut

Allied Liaison Officers

Lt Col Silvio Romero – Argentine Air Force Lt Col Oliver Schmelzer – German Air Force Maj Pedro Camarena – Mexican Air Force Maj Guillermo Cavo – Spanish Air Force

Visiting Professor

Dr. Nicole Smith - PhD, University of Nebraska, Lincoln

Language Specialist

Ms. Angela Brehm - German/French

Senior Programmer

Mr. Bertold L. Geiss

Director, Language Learning Center

Mr. Andrzej Pudlo

HISTORY

Department Head and Permanent Professor

Col Mark K. Wells - PhD, King's College, London

Deputy Department Head

Lt Col Vance R. Skarstedt—PhD, Florida State University

Professor

Dr. Jacob Abadi – PhD, New York University

Dr. Jeanne T. Heidler - PhD, Auburn University

Dr. John M. Jennings – PhD, University of Hawaii

Dr. Michael S. Neiberg - PhD, Carnegie Mellon University

Assistant Professor

Lt Col Howard G. Jones, III – PhD, Johns Hopkins University Lt Col James M. Tucci – PhD, University of Wisconsin Maj John E. Grenier – PhD, University of Colorado Maj Derek D. Varble – PhD, Oxford University Mr. Michael R. Terry – MA, University of North Dakota

Instructor

CDR (USN) Stuart T. Farnham – MA, University of Alabama Maj Stephen B. Bacon – MA, University of Alabama Maj Phillip M. Carr – MA, California State University-Stanislaus

Maj Daniel R. Moy – MA, University of Oklahoma
Maj Raymond M. Platt – MA, Ohio State University
Maj David Q. Schlortt – MA, University of Central Arkansas
Maj Jeffrey W. Stamp – MA, University of Alabama
Capt Maurizio D. Calabrese – MA, Naval Postgraduate School
Capt Dewayne J. Creamer – MA, Naval Postgraduate School
Capt Robert E. Duman – MA, University of Nebraska
Capt Eric W. Frith – MA, Old Dominion University
Capt Robert D. Levy – PhD, University of Minnesota
Capt Beth A. Myers – MA, University of Utah
Capt John D. Roche – MA, University of Colorado
Capt Kenneth D. Underwood – PhD, University of Nevada
Las Vegas

Capt Bruce L. Wykes - MA, University of Texas

Visiting Professor

Dr. Dennis E. Showalter - PhD, University of Minnesota

LA W

Department Head

Col Paul E. Priog - JD, University of Michigan Law School

Deputy Department Head

Lt Col Jeffrey C. Lindquist – LLM, George Washington University School of Law

Permanent Professor

Col Michael R. Emerson – JD, University of Denver College of Law

Associate Professor

Mr. John P. Hertel – LLM, George Washington University School of Law

Assistant Professor

Maj Charles E. Binder – JD, Duke University
Maj Christa S. Cothrel – JD, University of Missouri
Maj Laura I. Fernandez – LLM, University of Denver
School of Law

Maj Stephen A. Gontis – JD, University of Nebraska College of Law

Maj Daniel J. Higgins – JD, University of Wyoming College of Law

Maj Pamela T. Perry – JD, University of Missouri

Maj Mark D. Stoup - JD, University of Wyoming College of Law

Maj Dawn M. K. Zoldi – JD, Villanova University School of Law

Capt Darren C. Huskisson – JD, University of Nebraska College of Law

Capt Michael A. Lewis – JD, Boston College Law School Capt Todd E. McDowell – JD, University of Colorado Law School

MANAGEMENT

Department Head and Senior Military Professor

Col Kevin Davis - DBA, Harvard University

Permanent Professor

Col Rita A. Jordan – PhD, University of Colorado, Boulder

Distinguished Visiting Lecturer

Mr. Carl Janssen – MBA, University of California, Los Angeles

Professor

Dr James Barker – PhD, University of Colorado, Boulder

Associate Professor

Lt Col Steven Baker-PhD, Naval Postgraduate School Maj Andrew Armacost – PhD, Massachussets Institute of Technology

Dr. Steve Green - DBA, US International University

Dr. William Jennings - PhD, University of Michigan

Dr. James Lowe - PhD, Georgia Institute of Technology

Assistant Professor

Lt Col Andrew Giacomini – MSA, Central Michigan University Maj Steven Fraser – PhD, University of South Florida Maj Christopher Harper – MBA, Phillips University Maj Charles Murnieks – MBA, University of California Los Angeles

Maj Geoffrey Patterson – MSA, Central Michigan University Maj James Parco – PhD, University of Arizona

Maj Brett Scott - MBA, University of California - Irvine

Maj Robert Webb – MS, Air Force Institute of Technology

Dr. Cynthia Cycyota - PhD, University of Texas - Arlington

Dr. Claudia Ferrante – PhD, Carnegie Mellon

Dr. Kurt Heppard - PhD, University of Colorado, Boulder

Dr. Dave Levy - PhD, Cornell University

Instructor

Lt Col James Hurley - MBA, Chapman University Lt Col John Sacks - MA, Regent University

Lt Col Michael Stark - MS, Air Force Institute of Technology

Maj Keith McCartney - MBA, University of Texas, Austin

Maj Gregory Prothero - MS, University of Arkansas

Capt Nathan Atherley - MS, Boston College

Capt Johnathon Dulin - MS, Air Force Institute of Technology

Capt William Forster - MBA, University of Colorado, Colorado Springs

Capt Ryan Funkhouser - MS, Purdue University

Capt Gregory Martin - MBA, University of Notre Dame Capt Duncan Stewart - MBA, University of Notre Dame

Capt Robert Stiverson - MBA, University of Colorado, Colorado Springs

Capt Joseph Suhajda - MBA, Wright State University Capt Kevin Truslow - MBA, Georgia Southern

MATHEMATICAL SCIENCES

Department Head and Permanent Professor

Col Daniel W. Litwhiler - PhD, University of Oklahoma

Senior Military Professor

Col John Andrew - PhD, Harvard University

Visiting Professor

Lt Col Eunwoo Nam (ROKAF) - PhD, Univ of Florida

Associate Professor

Lt Col Keith Bergeron - PhD, University of New Mexico Lt Col Timothy R. Cooley - PhD, Rutgers University Lt Col Richard M. Schooff - PhD, University of Virginia Maj Curtis Martin - PhD, Air Force Institute of Technology

Maj James W. Wisnowski - PhD, Arizona State University Dr. Michael A. Brilleslyper - PhD, University of Arizona Dr. Kurt D. Herzinger – PhD, University of Nebraska Dr. Bradley A. Warner - PhD, University of Colorado Health Sciences Center

Assistant Professor

Lt Col Mark J. Gerken - PhD, Air Force Institute of Technology

Maj Patricia D. Egleston - PhD, Central Michigan University Maj Jeffrey H. Grobman - PhD, Colorado School of Mines Maj Lemuel R. Myers – PhD, Air Force Institute of Technology Maj Robert Wolverton - PhD, University of New Mexico

Maj Kevin Yeomans - PhD, North Carolina State University Dr. Jon Epperson - PhD, Texas A&M University

Dr. Michele Ghrist - PhD, Univ of Colorado

Dr. Dale C. Peterson - PhD, Rutgers University

Dr. James S. Rolf - PhD, Duke University

Dr. Lisbeth E. Schaubroeck - PhD, University of North Carolina

Instructor

Lt Col Gary Dameron - EE, Air Force Institute of Technology Maj Erik Demkowicz – MS, Deleware State University Maj Greg Elhers - MS, Air Force Institute of Technology Maj Kevin Ewing - MS, University of Tennessee Space Institute Maj Scott Graham - MS, Texas A&M University Maj Tony McKenzie - MS, Webster University Maj Marc Rathmann - MS, Webster University Maj Judith Peer - MS, University of Northern Colorado Maj Freddie L. Rodriguez - MS, University of Colorado Capt Stephanie Bruce - MS, North Carolina State University Capt John Camp - MS, Univ of Florida Capt James Carroll - MS, Lehigh University Capt James D. Cordiero - MS, Air Force Institute of Technology

Capt Andrew E. Coop - MS, Massachusetts Institute of

Capt Martin Gaupp - MS, Air Force Institute of Technology Capt Jeffrey D. Havlicek - MS, Air Force Institute of Technology

Capt Heath M. Holtz - MS, Georgia Institute of Technology Capt George Johnson - MS, Air Force Institute of Technology Capt Monica Madero-Craven - MS, University of Maryland Capt Scott Naylor - MS, Air Force Institute of Technology Capt Gilbert D. Ness - MS, Air Force Institute of Technology Capt Peter Sung - MS, University of California, Los Angeles Lt (USN) Daniel Turbeville, US Navy Nuclear Propulsion School 1Lt Joy M. Kaczor - MS, University of Phoenix

Dr. Ann Cushman – PhD, Colorado State University

PHILOSOPHY

Department Head and Permanent Professor

Col James L. Cook - PhD, Universtat-Heidelberg

Dr. Charles W. Hudlin - University of Oklahoma

Associate Professor

Dr. Carlos E. Bertha - PhD, University of South Florida Dr. J. Carl Ficarrotta - PhD, University of North Carolina, Chapel Hill

Assistant Professor

Lt Col Jesse D. Carter - MA, University of Southern California

Maj William D. Casebeer - PhD, University of California, San Diego Mr. John W. Bois – MA, University of Washington

Instructor

Maj Charles T. McIntyre - MA, Indiana University Capt Marc O. Hedahl - MA, University of Wisconsin, Milwaukee

Capt Mark S. Swiatek - MA, University of Texas, Austin

Visiting Professor

Dr. William H. Rhodes - PhD, University of Colorado, Boulder

Department Head and Permanent Professor

Col James H. Head - PhD, University of Kansas

Visiting Professor

Dr. Gregor M. Novak - PhD, Indiana University Professor

Lt Col Francis K. Chun – PhD, University of California, Los Angeles

Lt Col M. Geoff McHarg - PhD, University of Alaska, Fairbanks

Dr. Richard J. Cook - PhD, University of California, Davis

Dr. C. Lon Enloe - PhD, University of Michigan

Dr. Delores J. Knipp - PhD, University of California, Los Angeles

Dr. Randall J. Knize - PhD, Harvard University

Dr. Evelyn T. Patterson - PhD, University of Delaware

Associate Professor

Lt Col Scott C. Dudley - PhD, Washington University Lt Col Ryan K. Haaland – DPhil, Oxford University Lt Col Charles J. Wetterer - PhD, University of New Mexico Dr. Albert L. Batten - PhD, Colorado State University Dr. Derek L. Buzasi - PhD, Pennsylvania State University Dr. Fassil Ghebremichael - PhD, Washington State University Dr. Brian M. Patterson - PhD, University of Delaware

Assistant Professor

Lt Col James M. Dorman - MA, University of California, Davis

Lt Col Edward B. Tomme - DPhil, Oxford University Maj Kurt F. Brueske - PhD, University of Wisconsin-Madison

Maj W. Jody Mandeville - PhD, University of British Columbia

Capt M. Adrian Michalicek - PhD, University of Colorado Capt Russell F. Teehan - PhD, University of New Mexico Dr. Gabriel Font-Rodriguez - PhD, Stanford University Dr. Heidi V. Mauk - PhD, Kansas State University

Instructor

Lt Col Thomas R. Spicer - MS, Embry-Riddle Aeronautical University

Maj Anthony L. Franz - MS, Air Force Institute of Technology Capt Barry N. Behnken - MS, Air Force Institute of Technology Capt Michael L. Gauthier - MS, Colorado State University Capt Todd C. Monson - MA, University of Texas, Austin Capt L. Scott Watson - MS, University of New Mexico Mr. Mark V. Mayer - MS, Ohio State University Ms. Heather L. Preston - MS, University of Washington

Laser and Optics Research Center

Dr. Geoffrey P. Andersen (Research Associate) – PhD, Adelaide University, Australia

Dr. George Brooke (Research Associate) - PhD, Old **Dominion University**

Dr. Iyad A. Dajani – PhD, University of California, Berkeley Dr. Fassil Ghebremichael - PhD, Washington State University Dr. Michael A. Kelly (Research Associate) - PhD, University of New Mexico

Dr. Randall J. Knize (Director) - PhD, Harvard University Dr. Tetsu Takekoshi (Research Associate) - PhD, University of Southern California

Dr. Jeffrey Winiarz (Research Associate) - PhD, State University of New York, Buffalo

Space Physics Research Associate

Dr. Linda H. Krause - PhD, University of Michigan

POLITICAL SCIENCE

Department Head and Permanent Professor

Col Douglas J. Murray - PhD, University of Texas, Austin

Deputy Department Head, Professor

Lt Col Brenda J. Vallance - PhD, University of California, Los Angeles

Professor

Dr. Paul J. Bolt – PhD, University of Illinois

Director, Center for American and Comparative Defense

Lt Col Anne G. Campbell – PhD, University of Colorado, Boulder

Associate Professor

Lt Col Randall L. Robinson – PhD Claremont College Lt Col Collins G. Shackleford - PhD, University of

Lt Col Mark Gose - PhD, University of Colorado, Boulder Maj Thomas Mowle - PhD, Ohio State University Dr Paul O. Carrese - PhD, Boston College Dr. Francis T. Pilch - PhD, Yale University

Olin Chair

Gen USAF (Ret) James P. McCarthy, - MS, George Washington University

Posvar Chair

Ambassador Roger Harrison - PhD, Claremont University

Assistant Professor

Lt Col Jim Faber - MS, Troy State University Lt Col Greg Rose - PhD, University of Pittsburgh CDR (USN) Shoshana Chatfield - MA, John F. Kennedy School of Government, Harvard University Maj Vicki Rast - PhD, George Mason University Capt Cynthia Brothers - MA, University of Massachusetts, Amherst

Capt Deron R. Jackson - MALD, The Fletcher School of Law and Diplomacy, Tufts University Dr. Jeff Anderson - PhD Claremont College

Dr. Damon V. Coletta - PhD, Duke University

Dr. David Sacko - PhD, Penn State University

Instructor

Maj Mick Gleason - MS, Troy State University Maj Dan Lahman - MS, Troy State University Maj Pete Nielsen - MA, University of South Dakota Maj (USA) Shawn Walters - MA, University of Kansas Capt Jim Borders - MS, Joint Military Intelligence College

Capt Steve Folena - MS, Troy State University Capt Daniel Marine - MA, Arizona State University Capt Brian Tyler - MA, University of Maryland Capt Jodi Vittori - MS, Joint Military Intelligence College

Ms. Valarie Lynn, FSO - MA, University of Denver



Basic Sciences Major

The Basic Sciences Major is a divisional major incorporating the five basic sciences of biology, chemistry, computer science, mathematics, and physics. This divisional program is recommended for cadets who wish to major in the sciences but prefer a broad, flexible curriculum with a high degree of individual choice. This program is also a sensible alternative for cadets already declared in either a basic sciences or engineering disciplinary major who, for a variety of reasons,

find the divisional approach more suited to fulfilling

graduation requirements.

Since this is not a disciplinary major, cadets wishing to go to graduate school with a Basic Sciences Major will most likely be required to take additional undergraduate courses in the selected graduate discipline prior to entering graduate school. One notable exception involves medical schools, as most medical schools do not require any particular type of major in order to be accepted.



3 rd Class Year	2 nd Class Year	I st Class Year
Bas Sci Option 1	AeroEngr 315	Academy Option 1
Bas Sci Option 2	Bas Sci Option 4	Academy Option 2
Bas Sci Option 3	Bas Sci Option 5	Astro 320/410
Beh Sci 110	Bas Sci Option 6	Bas Sci Option 7
Bio 215	Econ 200	Bas Sci Option 8
Civ Engr 210	El Engr 215/231	Bas Sci Option 9
English 211	Energy/Systems Option	English 411
For Lang 1	Law 220	MSS 400
For Lang 2	Math 300/356	Open Option 1
History 202	Mgt 200	Open Option 2
Physics 215	Philos 310	Open Option 3
Soc Sci 112	Pol Sci 211	

General Engineering Major





The General Engineering Major is a divisional major incorporating the engineering disciplines of Aeronautical, Astronautical, Civil, Electrical, Environmental, and Engineering Mechanics. This divisional program is recommended for cadets who wish to major in engineering but prefer a broad, flexible curriculum with a high degree of individual choice. This program is an alternative for cadets already declared in an Engineering disciplinary major who for a variety of reasons, find the divisional approach more suited to fulfilling graduation requirements.

General engineers will usually work their way into engineering management, overseeing the completion of entire projects, while working closely with others who specialize in civil, mechanical, electrical or other engineering systems. While the opportunities for design engineering may be limited, responsibility should not be lacking. As part of a design or project management team, the opportunity for creativity will be virtually limitless as each end product is unique. General engineers will receive personal satisfaction for their valuable contributions to the Air Force.

The USAFA general engineering curriculum will not immediately prepare graduates to pursue an advanced degree in a specific engineering discipline. The general engineer may first be required to obtain an undergraduate degree from another university. Most universities require at least one year academic residence before granting a degree from their institutions. Some universities do not require an accredited undergraduate degree, but additional undergraduate work is necessary before acceptance into a graduate program.

The curriculum provides a cadet the maximum flexibility to selectively structure his/her academic program to individual preferences. The program, however, is not accredited under the Accreditation Board for Engineering and Technology (ABET). A Bachelor of Science degree in General Engineering is awarded upon completion of all requirements.

3 rd Class Year	2 nd Class Year	1 st Class Year
Bio 215 Civ Engr 210 Econ 200 English 211 Engr Option 1 Engr Option 2 Engr Mech 120 History 202 Math 243 Math 245 Mgt 200 Physics 215 Soc Sci 112	Aero 315 Aero 241/Engr 311/ Mech Engr 312 El Engr 215/231 English 311 Engr/Basic Science Option 1 Engr/Basic Science Option 2 Engr Option 3 Engr Option 4 For Lang 1 For Lang 2 Law 220 Math 300/356 Pol Sci 211 Philos 310	Academy Option 1 Academy Option 2 Astro 320/410 Engr Option 5 Engr Option 6 Engr Option 7 Engr Option 8 MSS 400 English 411 Energy/Systems Option

ENGINEERING (Engr)

Offered by various departments within the Engineering Divisions.

Engr 100. Introduction to Engineering Introduces the USAFA engineering disciplines in the context of the engineering design process. Cadets will integrate these disciplines using a semester-long group design project. Cadets will employ modern computational tools to explore design alternatives and communicate their design solution. Administered by the Engineering Division with instructors from all engineering departments.

Engr 311. Electrical Power Systems. Applications of the principles of energy conversion to electrical power systems. Generation, transmission, distribution and consumption of electrical energy in ground- and aircraft-based systems. Fulfills Engr 310 core requirement only for cadets majoring in electrical, civil, computer engineering, computer science, or physics.

Engr 341. Linear Systems Analysis and Design. Analysis and design of linear systems. Includes modeling of electrical and mechanical systems; characterization of physical systems using linear, constant-coefficient differential equations; and state-space models; Laplace Transform techniques; identification of system response using frequency response and Bode plots; specification of design criteria in the s-domain; and modification of system parameters to satisfy design requirements. MATLAB™ computer programming is taught and the MATLAB™ computer interface is used for analysis and design.

Engr 342. Linear Control System Analysis and Design. Formulation and analysis of the linear control problem by transform methods. Synthesis of linear control systems emphasizing the root locus and Bode methods. Includes laboratory analysis and synthesis with real hardware and/or MATLABTM simulation.

Engr 400. Divisional Seminar. An interdisciplinary study of engineering concepts, with emphasis on applications of fundamental principles. Includes case study, research, preparation and presentation of at least one major paper.

Engr 495. Special Topics in Engineering. Selected topics in engineering, administered by various Engineering departments.



Humanities Major



The Humanities Major is a divisional major requiring 142 semester house for graduation. The major includes courses from each department in the Humanities (English and Fine Arts, Foreign Languages, History, and Philosophy). A wide variety of elective options allows students the flexibility to tailor the major to individual interests. In addition, the divisional options make the major ideal for students who wish to minor in either Foreign Languages or Philosophy.



Humanities majors confront fundamental questions of human existence. They enhance their reasoning ability, as well as their writing and speaking skills, by developing proficiency in critical and creative thought through an exploration of the ideas embodied in great works of writers and artists. The Humanities major prepares cadets for graduate study and for a wide variety of career fields.

A major in the humanities will prepare you to enter most Air Force specialties. However, there is no Air Force specialty that either requires or recommends the Humanities Major. Specialities not open to a major in the humanities are those requiring degrees in engineering, computer science, math, physics, chemistry, or biology. Nevertheless, the Humanities Major provides many options to specialize as necessary. For example, if you know you want to work as an Intelligence

Applications Officer, it would be useful to minor in a foreign language and take appropriate history and political science courses to make you competitive in the specialty.

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110 Econ 200 English 211 Engr 100 Engr Mech 120 For Lang 3 For Lang 4 History 202 Law 220 Mgt 200 Physics 110	Bio 215 Civ Engr 210 El Engr 215 English 411 Hum Div Option 1 Hum English Option Hum Fine Arts Option Hum History Option Math 300	Aero Engr 315 Academy Option 1 Academy Option 2 Astro 410 Geog 340 Hum Div Option 2 Hum Div Option 3 Hum Div Option 4 Hum Div Option 5
Physics 215 Pol Sci 211	Philos 310 Philos 390	Hum Div Option 6 MSS 400

FINE ARTS (Fine Art)

Offered by the Department of English & Fine Arts.

Fine Art 375. Introduction to Film Studies. A structured introduction to cinema. Course will take a thematic or chronological approach to the study of film as art form, with attention to film-making techniques, narration, forms of genre, and modes of production.

Fine Art 452. Art in History. An historical survey of art from ancient to contemporary time. Study of major periods, schools, styles of art, and biographies of important artists. Course provides students with historical, social, and political contexts of art masterpieces using slides, CD-Roms, and videos.

Fine Art 458. Music Appreciation. Survey of music of the Western world and a study of basic elements, forms, and styles in representative works by major composers. Emphasis on listening, understanding, and appreciation.

Fine Art 459. Intro to Drawing and Design. This course teaches drawing and sketching from the ground up. Designed for students with no practical studio experience, the course requires students to keep a sketchbook and gain practical experience in drawing using a variety of materials. Students will apply principles and elements of design to drawing tasks in charcoal, pastels, conte crayon, ink, and other media.

Fine Art 460. Studio Art. This studio art course presents students with a comprehensive overview of a variety of art techniques and projects in 2-D and 3-D processes. Blocks of instruction include: Drawing and Painting, Printmaking, Sculpture, and Pottery.

Fine Art 461. Advanced Studio Art. A studio course for students who have previous art studio experience. Students design art projects which provide more artistic and technical challenges than Fine Art 460.

Fine Art 477. Fine Arts in the USA. This course offers an interdisciplinary approach to the arts in the United States with emphasis on the United States. A chronological approach to the content will explore common themes in the arts by studying archeology, painting, sculpture, and music. Students can expect to experience the arts through slides, musical selections, guest artist, film, videotapes, and other media.

Fine Art 495. Special Topics. Selected special topics in Fine Arts.

Fine Art 499. Independent Study. Independent

study in art or music. Subject and meetings arranged with the instructor.

HUMANITIES (Hum)

Offered by the Departments of the Humanities Division.

Hum 200. Introduction to the Humanities. Interdisciplinary Course. A seminar-style introduction to the intellectual history of Western Civilization through literature, philosophy, the fine arts, and the history of law and science. The course aims to lay the foundation for further study in the disciplines of the humanities, to enhance integrated knowledge and critical thinking, and to prepare students for advanced study.

Hum 400. Humanities Seminar. Interdisciplinary Course. A seminar focused on the history of Western Civilization, through literature, the arts, and philosophy. Related topics include the history of law and science, and their impact on trends in the humanities. This approach is invaluable for enhancing integrated knowledge and critical thinking, and is excellent preparation for cadets wishing to pursue graduate studies.

Hum 430. The Holocaust. The subject of the Holocaust, the destruction of the Jews of Europe and others at the hands of the Nazis and their collaborators, is of great significance in the history of human civilization. The extensive documentation of this systematic genocide lends itself to the pedagogical examination of critical lessons in the study of human history and behavior, as well as ethical issues. Through this investigation cadets can also understand what it means to be a responsible citizen and soldier.

Hum 461. Russian Literature. A study of representative Russian authors (such as Pushkin, Chekhov, Dostoevsky, Tolstoy, Sholokhov, Pasternak, and Solzhenitsyn) in their historical and cultural setting and their impact on the shaping of the national character of the Russian people.

Hum 463. Far Eastern Literature. A historical survey and analysis of major literary works of the Far East with emphasis on China and Japan.

Hum 495. Special Topics. Selected topics in the humanities.

PHILOSOPHY (Philos)

Offered by the Department of Philosophy.

Philos 310. Ethics. A critical study of several major moral theories and their application to contemporary moral problems with special emphasis on the moral problems of the profession of arms.

Philos 311. War, Morality, and the Military Profession. An in-depth examination of the moral issues raised by the profession of arms. Presumes an understanding of moral theory, as a minimum: relativism, egoism, utilitarianism, and deontology.

Philos 330. Introduction to the Philosophy of Science. An analysis of the basic assumptions and principles of the sciences. Types of topics considered include the scientific method, scientific laws, theory construction, scientific explanation, probability, the relationship between the social sciences and the physical sciences, and the relationship between the sciences and the humanities, especially in the formation of values.

Philos 360. Applied Reasoning. An introduction to basic deductive and inductive applied logic. Includes an analysis and evaluation of the notions of evidence and good arguments in fields such as law, medicine, science, engineering, behavioral and social sciences, and military studies.

Philos 370. Introduction to Symbolic Logic. A course in formal logic that examines propositional and predicate languages, model theory, quantifiers, proofs, identity theory, and properties of logical systems.

Philos 382. American Philosophy. An examination of the philosophic background of Puritanism, the Revolutionary period, transcendentalism and pragmatism with special reference to the thought of major American philosophers such as Pierce, James, Royce, Santayana, and Dewey.

Philos 390. The Great Philosophers. An in-depth study of central Western philosophers and their systems of philosophy. Philosophers read will include some of the following: Plato, Aristotle, Augustine, Aquinas, Descartes, Locke, Berkeley, Leibniz, Hume, Kant, Hegel, Schopenhauer, and Nietzsche.

Philos 395. Philosophy of Law. This course will serve as an introduction to legal philosophy and its relations to moral reasoning. Emphasis on the nature of law, its authority, its relations to morals, the controversies over judicial decision-making, the justification of states interfering with the liberty of its individual citizens, the various different or competing senses of "justice," the question of responsibility, and the justification of legal punishment.

Philos 400. Global Philosophy of Religion. A comparative study of the world's great religions that examines the relation of religion to morality;

the nature of religious aspirations; the spiritual influence of religion upon culture and society; the sacred scriptures; the concept of God, salvation, evil, and the afterlife. Studies Christianity, Buddhism, Judaism, Hinduism, Confucianism, and Islam.

Philos 410. Medical Ethics. Ethics applied to biomedical issues using a seminar approach. Ethical problems considered will include informed consent, refusal of treatment, suicide, killing and letting die, paternalism, allocation of health care, patient confidentiality, codes of medical ethics, and specific case analyses.



Philos 495. Seminar in Philosophy. Selected topics in philosophy.

Philos 499. Independent Study. Philosophical research guided by an instructor.

Social Sciences Major

The social sciences deal with human behavior in its social and cultural aspects. At the Air Force Academy, the following disciplines are within the social sciences: Economics, Geography, Management, Law, Political Science, and Behavioral Science.

The major in social sciences is designed for the cadet whose interests and abilities lie in the area of the social sciences but who prefers a broader program than a major in only one discipline would provide. The major requires completion of at least one course, as indicated below, in four of the six social science disciplines. More concentrated study in one discipline is possible through the use of the social science divisional options.

The Social Sciences Major provides a broad background for the cadet interested in the disciplines within the social sciences. Flexibility in course selection is one advantage of this major. A specialized degree in a particular discipline would be an option after graduation from the Air Force Academy.

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	AeroEngr 315	Academic Division Option
Civil Engr 210	Bio 215	Academy Option
Econ 221/Mgt 201	English 411	Astro 410
El Engr 215	Math 300	MSS 400
English 211	Philos 310	Soc Sci Breadth Option 4
Engr Mech 120	Pol Sci 311	Soc Sci Div Option 3
History 101	Soc Sci Breadth Option 2	Soc Sci Div Option 4
History 202	Soc Sci Breadth Option 3	Soc Sci Div Option 5
Law 220	Soc Sci Div Option 1	Soc Sci Div Option 6
Physics 215	Soc Sci Div Option 2	500 C
Soc Sci Breadth Option 1	Systems Option	



SOCIAL SCIENCES (Soc Sci)

Soc Sci 400. Social Sciences Seminar. Interdisciplinary course. An interactive seminar focused on relevant social sciences topics.

Soc Sci 401. Creativity. The course is designed to help cadets appreciate and enhance creativity for themselves and their subordinates. Incorporates three distinct perspectives to structure seminars and activities. Students gain an appreciation of the causes and potential consequences of creativity by studying the lives of individuals commonly recognized as the architects of the modern era (e.g., Einstein, Picasso, Stravinsky, Eliot, Freud, Graham, and Gandhi). Examining the influences of factors such as intelligence, knowledge, style, personality, motivation and the environment on creativity helps cadets recognize how they can cultivate creativity in a culture of conformity.

Soc Sci 420. Law and Economics. An

interdisciplinary course which examines various legal issues from an economics perspective. The course employs basic economic principles in an effort to understand the nature of legal rules, their effect on society and to suggest how these rules might be reformed. This framework is applied to tort law, criminal law, contract, and property law.

Soc Sci 483. Principles of Negotiation and the Mediation Process. A study of the process of negotiation in all kinds of conflicts, from negotiating with family members to international, multiparty disputes. The course focuses on an "interest-based" approach to negotiations to achieve more effective, efficient, durable agreements. Students will study a model approach and will experiment with that approach in a variety of simulated negotiations. Students will also learn the Air Force Mediation process and practice using it.

Aeronautical Engineering Major





he aeronautical engineering profession involves the design, development, testing, manufacturing and maintenance of all atmospheric aircraft. Air Force aeronautical engineers are strongly involved in the national commitment of maintaining global air superiority through the deployment of state-of-the-art aircraft for the US Air Force. Guided by an awareness of our Mission and Vision, the Aeronautics Department contributes actively to this commitment by conducting a nationally accredited educational program exclusively designed to prepare cadets for service to the Air Force as skilled entry level aeronautical engineers, or to be prepared to pursue graduate studies at any university.

Mission Statement: To support the USAFA Mission by developing and inspiring young men and women to become Air Force officers with a specialization in aeronautical engineering.

Vision Statement: To operate a preeminent department of aeronautics committed to producing second lieutenants of exemplary character and professional competence in aeronautical engineering, motivated and devoted to public service in the United States Air Force.

3rd Class Year	2nd Class Year	1st Class Year
Aero Engr 241	AeroEngr 341	Academy Option 1
Aero Engr 315	Aero Engr 342	Academy Option 2
Astro 320	Aero Engr 351	Aero Engr 442
Beh Sci 110	AeroEngr 352	Aero Engr 471
Civ Engr 210	Aero Engr 361	Aero Engr 481
Econ 200	Bio 215	Aero Engr 482
El Engr 215	Engr Mech 320	Aero Engr Elective
English 211	History 202	English 411
Math 243	Law 220	Engr Mech 330
Math 245	Math 346	MSS 400
Mgt 200	Math 356	Philos 310
Physics 215	Pol Sci 211	Structures Elective
Soc Sci 112		

Program Operational Goals define attributes and capabilities Academy graduates are expected to exhibit as young alumni of the USAFA aeronautical engineering program.

The goals of the Aeronautical Engineering Program are to prepare cadets to become Air Force Officers who:

- 1. Possess breadth of integrated, fundamental knowledge in engineering, basic sciences, social sciences, and humanities; and depth of knowledge in aeronautical engineering.
- 2. Communicate effectively.
- 3. Work effectively on teams and grow into team leaders.
- 4. Are independent learners, and as applicable, are successful in graduate school.
- 5. Can apply their knowledge and skills to solve Air Force engineering problems, both well- and ill-defined.
- 6. Know and practice their ethical, professional, and community responsibilities as embodied in the United States Air Force Core Values.

Program Curricular Outcomes

The Program Operational Goals are realized by ensuring graduates of the aeronautical engineering program have the ability to:

- 1. Use fundamental knowledge of aerodynamics, aerospace structures and materials, propulsion, flight mechanics-stability and control, experimental and computational skills, and aircraft design or aircraft engine design to solve aeronautical engineering problems.
- 2. Plan and execute experimental studies and formulate sound conclusions from analysis of the empirical data resulting from them.

- 3. Use basic skills in problem solving to include fundamental knowledge outside aeronautical engineering along with modern technology-tools.
- 4. Develop and evaluate engineering designs that meet customer needs.
- 5. Communicate effectively using oral, written, graphical and electronic formats.
- 6. Work effectively as a member of a multidisciplinary team.
- 7. Perform effective research, and possess the skills to engage in independent learning.
- 8. Informatively discuss the inpact of engineering on present-day societal and global contemporary issues to include Air Force aerospace capabilities and requirements.
- 9. Make morally responsible judgments about legal, environmental, and ethical implications of engineering, management and business decisions.

Job Expectations

In addition to graduate school opportunities, Air Force aeronautical engineers can expect job assignments as either engineer practitioners or program managers in Air Force laboratories or System Program Offices; assignments to experimental test pilot, experimental test navigator, or flight test engineer positions, or to aircraft maintenance positions on numerous Air Force aircraft. Some officers also can be assigned to analytical scientist positions, or to acquisition managerial positions.

USAF Test Pilot School

Officers with aeronautical engineering degrees are academically qualified for the USAF Test Pilot School as a test pilot, a test navigator, or a flight test engineer. Approximately 100 flight test engineer positions are available in the Air Force. Officers assigned as flight test engineers actively participate in flight-test or test-chase aircraft missions.

Curriculum Overview

In addition to completing all degree requirements in the USAFA academic core, cadets majoring in aeronautical engineering complete a minimum of 12 engineering courses giving them knowledge and skills in six basic disciplines: 1. Aerodynamics. 2. Aerospace Materials and Structures. 3. Propulsion. 4. Air Flight Mechanics. 5. Experimental and Computational Investigations. 6. Aircraft and Aircraft Engine Design. A brief explanation of each discipline and the relevant courses, number and title only, are presented below. Curricular details for each course can be found in the USAFA Curriculum Handbook.

I. Aerodynamics (requirement: 3 courses)

The primary purpose of the Aerodynamics Discipline is to teach cadets how and why airplanes fly. With the foundations of flight and aerodynamics initially studied in the core engineering course, Aero Engr 315, Fundamentals of Aeronautics, cadets acquire indepth knowledge on the principles of fluid mechanics and gas dynamics, especially with regard to fluid flows over and around solid objects in moving streams. As airplanes fly faster, the aerodynamics become more involved because lift and drag are strongly affected by airplane speed. Understanding these effects, and being able to use theory and mathematics to design airplanes correctly requires cadets to first learn the fundamentals and then build upon this understanding by applying the fundamentals to the aerodynamics of winged aircraft. The three courses in this discipline establish a knowledge base cadets will use later in Aero Engr 481 & 482 to design, build and test specific aircraft.

Required Courses

Aero Engr 341. Aeronautical Fluid Mechanics.

Aero Engr 342 Aerodynamics.

Aero Engr 442. Advanced Aerodynamics.

Electives

Aero Engr 446. Hypersonics.

Aero Engr 447. Advanced Applied Aerodynamics.

II. <u>Aerospace Materials and Structures</u> (requirement: *Engr Mech 330, Static Analysis of Structures*, and one materials and structures elective)

The primary purpose of the Aerospace Materials and Structures Discipline is to give cadets basic knowledge and understanding of how aerospace structures are designed and built. Aircraft have very special but fundamentally simple requirements: they must be strong, failsafe and lightweight. Engineers designing or working on modern day aircraft systems must know how to make safe, lightweight structures. This means they must understand how to use composite materials and sturdy construction design strategies. Building on the foundations developed in Engr Mech 120 (see Engineering Mechanics section), cadets learn the physical fundamentals affecting the design of basic aerospace structures. Emphasis is placed on learning to predict how beams bend, twist or buckle, and fail, and then using such knowledge to design lightweight safe structures. Engr Mech 330 provides a basis from which cadets must choose from a set of elective courses their preference for a specialization in this discipline. The elective options allow cadets to learn more about structures, or more about materials, or more about modeling and design using finite element analysis, a powerful computational tool for designing material structures.

Electives

To fulfill degree requirements for this discipline, cadets must select one additional course from the Engineering Mechanics electives shown below.

Engr Mech 332. Analysis and Design of Aerospace Structures.

Engr Mech 350. Mechanical Behavior of Materials. Engr Mech 431. Introduction to Finite Element Analysis.

Aero Engr 436. Aeroelasticity.

Required Courses

Engr Mech 432. Finite Element Analysis.

III. <u>Propulsion</u> (requirement: *Aero Engr 361*. *Propulsion I*)

The primary purpose of the propulsion discipline is to provide cadets fundamental knowledge and understanding of air breathing propulsion systems. This introductory course teaches the principles of propulsion to include description and study of turbine engine components. Following this, cadets then learn about many modern-day engines such as turbofans, turboprops, ramjets and scramjets. Cadets also learn about rocket systems and rocket nozzles. Since the gas flow through these systems is often very fast, cadets learn the fundamentals of compressible gas dynamics: they learn about shock waves, heat transfer, and friction effects in fast moving gas streams. Emphasis is placed on teaching these fundamentals using many real-world applications especially with regard to systems currently being used in Air Force airplanes.

Electives

Aero Engr 466. Propulsion II.

Aero Engr 483. Aircraft Engine Design (capstone design course).

Aero Engr 495. Special Topics. Aero Engr 499. Independent Study.

<u>IV. Aircraft Flight Mechanics</u> (requirement: 3 courses)

The primary purpose of the aircraft flight mechanics discipline is to teach cadets the fundamentals of aircraft performance, stability, and control. Aircraft in flight experience many different forces. In addition to understanding how aircraft behave in takeoff, landing, maneuvering, and cruise modes, cadets learn how design insights are used to achieve controlled flights for conventional and high performance aircraft. Learning how aircraft are controlled in flight is an important aspect of this discipline. All aircraft have a variety of specially designed control surfaces, and a variety of sensors that tell how the aircraft is behaving. Together, these devices control the flight of the aircraft. To design these devices correctly, engineers first need to understand the forces acting on and influencing the motion of the aircraft, and the processes used to sense aircraft responses as intelligible signals that can be fed to a control system to improve the flight of the aircraft. A two-course sequence teaches cadets these fundamentals. In Engr Mech 320, Dynamics, cadets learn the fundamentals of dynamics prior to taking the aircraft dynamics course.

Aero Engr 351. Aircraft Performance and Static Stability.

Aero Engr 352. Aircraft Dynamics Stability and Control.

Electives

Aero Engr 456. (plus lab) Flight Test Techniques. Aero Engr 457. Aircraft Feedback Control. Aero Engr 456, Flight Test Techniques, is a unique offering at USAFA. Based around four flights in a Cessna T-41D aircraft at USAFA, cadets learn to develop, execute, and present the results from performance and flying qualities of this aircraft. In their final project, cadets conduct a flight test evaluation of the Northrop T-38A supersonic advanced trainer aircraft at the Air Force Flight Test Center, Edwards Air Force Base, CA.

V. Experimental and Computational Investigations (requirement: Aero Engr 471, Aeronautical Laboratory)

The primary purpose of the experimental and computational investigations discipline is to teach cadets how to gain understanding about important aerodynamic phenomena through the use of wind tunnels and computer models. In Aero Engr 471, cadets learn how to plan and conduct wind tunnel experiments in which the lift and drag forces acting on aircraft models are measured. They also learn how to analyze and interpret these measurements so that good decisions can be made about the design of new aircraft. Throughout the curriculum, cadets learn how to use computer models to understand the physics associated with air flowing over aircraft wings and bodies. This understanding promotes the development and evaluation of new ideas about how to make aircraft fly faster, higher, further and with greater maneuverability. In Aero Engr 442, Advanced Aerodynamics, cadets learn the fundamentals of computational fluid dynamics (CFD), and how to use existing CFD codes to obtain information on an actual problem. Electives involving research are available using the Aero Engr 495 and Aero Engr 499 courses.

VI. <u>Aircraft and Aircraft Engine Design</u> (requirement: Aero Engr 481, Introduction to Aircraft and Propulsion System Design plus one of the design electives shown below)

The primary purpose of the aircraft and aircraft engine design discipline is to teach cadets how to use their knowledge and understanding of aerodynamic principles to design and build an aircraft system that meets specific customer needs. A two course sequence is used to accomplish this objective. All cadets take *Aero Engr 481*, the basic course that introduces and teaches the fundamentals of engineering design. Then depending on preference, cadets continue their design experience by working on a real aircraft design (*Aero Engr 482*), or a real aircraft engine design (*Aero Engr 483*). In both courses, cadets have strong interaction with and very often present the results of their design project to industry engineers.

Electives

Aero Engr 482. Aircraft Design. Aero Engr483. Aircraft Engine Design.

Astronautical Engineering Major

Do you want to design, build, launch, and operate a satellite or rocket? If so, consider majoring in astronautical engineering. This major is among the most challenging disciplines available here at the Academy, but the benefits are enormous. The Astronautical Engineering Major is the broad application of science and engineering to aerospace operations. Special emphasis is placed on astrodynamics, aerospace systems design, and control systems; design and depth options allow further concentration in one of these areas. Thus, the cadet is prepared for Air Force duty with specialization in research, design, development and analysis of space technology and aerospace avionics. Cadets who successfully complete this major are awarded the degree of Bachelor of Science in Astronautical Engineering, which is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and

Technology (ABET). This is unique, since no other university in the nation offers an accredited undergraduate degree in this field. If you are a top performer in the major, graduate school can be an option as a first Air Force assignment, either by winning a prestigious national scholarship (Guggenheim, Hertz, Rhodes, etc.) or through direct department sponsorship.

The goals of the Astronautical Engineering Program are to prepare cadets to become Air Force Officers who:

- 1. Possess a fundamental knowledge in astronautical engineering.
- 2. Can communicate effectively.
- 3. Work effectively with others.
- 4. Are committed to life long learning.
- Can apply their knowledge and skills to frame and solve Air Force engineering problems, both well- and ill-defined.
- Know their ethical and professional responsibilities as embodied in the United States Air Force core values.



Brd Class Year	2nd Class Year	1st Class Year
Aero Engr 241	Aero Engr 315	Academy Option 1
Astro 320	Astro 321	Academy Option 2
Bio 215	Astro 331	AeroEng 315
El Engr 231	Astro 351	Applied Astro Option 1
English 211	Civ Engr 210	Applied Astro Option 2
Engr Mech 120	Econ 200	Astro 432
Engr Mech 320	Engr 341	Astro Depth Option
History 202	Engr 342	El Engr 447
Math 243	Engr Mech 330	English 411
Math 245	Law 220	MSS 400
Physics 215	Math 346	Philos 310
Soc Sci 112	Math 356	Pol Sci 211
	Mgt 200	Space Environment Option
Physics 215	Math 346	Philos 310 Pol Sci 211

The Program Operational Goals describe what the Air Force would like to see in our graduates as they begin their careers as Air Force Engineering Officers. To best support these goals our program's curriculum is designed such that, by graduation, our graduates possess certain qualities or outcomes. These Program Curricular Outcomes are listed below. Upon successful completion of the Academy program in Astronautical Engineering, cadets will have the ability to:

- Use fundamental knowledge of orbital mechanics, space environment, attitude control, telecommunications, space structures and rocket propulsion to solve astronautical engineering problems.
- 2. Plan and execute experimental studies and formulate sound conclusions, analyzing empirical data.
- 3. Apply modern technology tools to solve astronautical engineering problems.
- 4. Communicate effectively using oral, written, graphical and electronic format.
- Recognize the ethical and professional responsibilities of Air Force Officership and the engineering profession.
- 6. Work effectively as a member of a multi-disciplinary team.
- 7. Recognize the benefits of and possess the skills needed to engage in life-long learning.
- 8. Informatively discuss the impact of engineering on present-day societal and global contemporary issues to include Air Force Aerospace capabilities and requirements.

Astronautical engineers either design or supervise design and development of ballistic missiles, spacecraft, and related astronautical equipment. They also conduct tests and analyses; recommend acceptance or non-acceptance of ballistic missiles, spacecraft, and related astronautical equipment; and manage research and development in astronautical engineering. Astronautical engineers have the potential of working all across the globe. The astronautical engineering degree also satisfies the educational requirements for Air Force Test Pilot, Flight Test Navigator, and Flight Test Engineer duties.

ASTRONAUTICS (Astro/Engr)
Offered by the Department of Astronautics.

Astro 320. Introduction to Astronautics for the Engineer and Scientist. Detailed analysis of the problems and principles of astronautics. The restricted two-body problem is examined to describe orbital motion, define orbital parameters, develop methods of orbit determination, investigate orbit transfers and plane changes, solve satellite rendezvous problems, and generate ground tracks. Other elements of space missions, including spacecraft systems, rockets, operations, and command, control, and communications, are also examined. Emphasis is placed on modeling problems, producing detailed mathematical solutions to the equations of orbital dynamics, using structured computer programs to solve basic problems in astronautics, and communicating results through written reports.

Astro 321. Astrodynamics. An intermediate course in orbit mechanics. Topics include orbit determination and prediction, orbit maneuvers, perturbations, rendezvous and proximity operations. Emphasis is on the design and use of structured computer programs to solve real-world astrodynamics problems. Programming experience is recommended.

Astro 331. Space Systems Engineering. Fundamentals of space vehicle design are presented with an emphasis on spacecraft subsystems. Introduction to and analysis of structures, propulsion, electrical power, flight computers, command and data handling, attitude control, and thermal control subsystems are covered. A primer on specific topics in digital electronics is included as well as some hands-on laboratory experience. System-level spacecraft design issues are covered including reliability, environments, radiation effects, testing, materials engineering, integration, launch vehicles, and operations. A special topic in electronics circuits for small satellites is also presented. The course includes a group project phase during which students perform design work and analysis of a future USAFA aerospace vehicle.

Astro 351. Rocket Propulsion. Introduction to rocket propulsion and propulsion system design. The basic laws of thermodynamics, thermochemistry, and conservation are used to determine ideal motor performance. Emphasis is placed on describing the components and conceptual design criteria for liquid, solid, and hybrid rockets. Electric, nuclear, and other advanced propulsions systems are also studied

Astro 410. Introduction to Astronautics. Introduction to the principles, problems and history of space for the non-engineer. Elements of space missions are examined including orbits, spacecraft systems, rockets, operations, and command, control and communications. Emphasis is placed on the conceptual understanding of orbital mechanics and its application to maneuvers in space, the selection and design of spacecraft payloads and systems, and the communication of these principles through both oral and written reports.

Astro 422. Advanced Astrodynamics. A continuation of Astro 321. The course focuses on applying numerical and analytical techniques to solve realistic Air Force problems in astrodynamics and space operations. Perturbations and the associated effects on satellite orbits are examined. Least squares and Kalman filter estimation techniques are applied to the orbital prediction problem using batch and sequential processing. Structured computer programming is used extensively in problem solutions.

Astro 423. Space Mission Design. Basic design principles for Air Force and civilian launch systems are examined. Mission objectives and constraints, feasibility studies, time-line generation, launch, onorbit, and recovery operations, and contingency planning are studied. Structured computer programming is applied to analyze typical space missions.

Astro 436. Small Spacecraft Engineering I. An introduction to small satellite systems engineering. Multi-disciplinary system design of spacecraft hardware and software to include subsystems, payloads, and ground stations. Define mission and

system requirements, perform engineering trade studies, design and analyze spacecraft systems.

Astro 437. Small Spacecraft Engineering II. A second course in small satellite systems engineering. Multi-disciplinary system design and fabrication of spacecraft hardware and software to include subsystems, payloads, and ground stations. Finalize design, fabricate, test, and fly actual spacecraft on space boosters.

Astro 443. Digital Control Theory and Design. Introduction to the theory and implementation of digital control systems. Topics include analysis of sampled data systems, z-transform theory, design techniques using discrete equivalents, and direct digital design methods. Emphasis is placed on the design control systems using microcomputers.

Astro 444. Modern Control Theory and Design. An introduction to advanced control techniques. Topics include state-space fundamentals, state feedback control, optimal control methods, and estimation theory. Additional topics may include nonlinear control, adaptive methods, and robust control methods. Methods are applied to the design of control systems methods, and robust control methods are applied to the design of control systems for aircraft and spacecraft.

Astro 445. Spacecraft Attitude Dynamics and Control. Fundamental introduction to the problem of controlling satellite attitude. Topics include direction cosine and Euler angle attitude parameters, torque-free rigid body motion, flexible body effects and energy dissipation, spin stabilization, gravity-gradient stabilization, momentum and reaction wheel control, and reaction jet control. Projects include the development of a satellite attitude dynamics simulation and the design of a reaction wheel and reaction jet attitude control system

Astro 446. Space Navigation. Inertial navigation including studies of the accelerometers and gyroscopes used in strapdown platforms, system mechanization, navigation equation development and system error analysis. Non-inertial navigation including studies of Global Positioning System (GPS), star trackers, and other position, velocity, and attitude sensors. Aided navigation methods using least squares and optimal estimation techniques. Projects include simulation of solid state optical gyros, and development of an aided navigation algorithm

Astro 452. Rocket Engineering I. An introduction to rocket systems engineering. Design, fabrication and operational testing of aerospace vehicle systems and subsystems. Students design, build, and launch a sounding rocket with instrumented payloads using systems engineering design techniques. The course relies on analysis and synthesis tools and techniques developed previously in the areas of structures, dynamics, propulsion, control, instrumentation, and computer simulation.

Astro 453. Rocket Engineering II. A second course in rocket systems engineering.

Astro 495. Special Topics. Selected topics in astronautics.

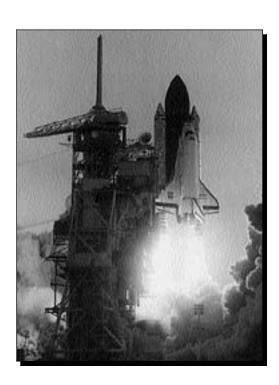
Astro 499. Independent Study. Individual study and research supervised by a faculty member.

Astro 543. Methods of Optimization for Engineers. Course in optimization methods taught at graduate level. Topics include parameter optimization, optimization for dynamic systems, optimal control and numerical solutions.

Astro 592. Methods of Optimization for Engineers. Course in optimization methods taught at graduate level. Topics include parameter optimization, optimization for dynamic systems, optimal control and numerical solutions.

Engr 341. Linear Systems Analysis and Design. Analysis and design of linear systems. Includes modeling of electrical and mechanical systems; characterization of physical systems using linear, constant-coefficient differential equations and state-space models; Laplace Transform techniques; identification of system response using frequency response and Bode plots; specification of design criteria in the s-domain; and modification of system parameters to satisfy design requirements. MATLABTM computer programming is taught and the MATLABTM computer interface is used for analysis and design.

Engr 342. Linear Control System Analysis and Design. Formulation and analysis of the linear control problem by transform methods. Synthesis of linear control systems emphasizing the root locus and Bode methods. Includes laboratory analysis and synthesis with real hardware and/or MATLABTM simulation.



Behavioral Sciences & Leadership Major

No matter what you do in life, you'll be working with people. Your success in any field will depend largely on your understanding of yourself and others and your ability to work together. The Behavioral Sciences & Leadership Major lays the foundation for this understanding. Three academic tracks are offered in the major: Counseling and Human Development, which emphasizes personal growth and adjustment. Human Factors and Systems Design, which focuses on how people interact with the machines and systems they use; and Behavioral Science, which allows students the opportunity to choose courses of the greatest interest to them. Each track emphasizes understanding people, but in different contexts.

COUNSELING AND HUMAN DEVELOPMENT OPTION

In this track, you'll examine the potential as well as the limitations of human behavior. You'll study such issues as how to motivate people to strive for excellence—whether it be in sports, school, work, or combat. The person who understands the principles of human interaction is well on the way to being a better coach, teacher, boss or commander. You'll study what makes you and others "tick." You'll investigate how groups, organizations, and individuals interact and affect each other. To accomplish this, you'll consider relevant, real world problems, such as what causes an individual to experience stress at work or in relationships and what is the best way to cope with it. By the time you finish your studies here, you should better understand and appreciate yourself, the groups you are in, and the organizations in which you'll live and work.

HUMAN FACTORS AND SYSTEMS DESIGN OPTION

"If anything can go wrong, it will." (and Murphy was an optimist). You might call Murphy the philosophical father of human factors (HF). Any person-machine system is apt to fail. What the HF specialist tries to do is improve the interaction between people and the machine elements of a system to optimize performance and minimize the likelihood of errors or failures. From the complex space shuttle system to a simple hand tool, human factors' goal remains one of matching the unique abilities of people with increasingly complex mechanical and electronic systems. To accomplish this goal, we give you a taste of the many fields that combine to form the HF perspective. You'll be introduced to the capabilities and limitations of human operators, see how these characteristics affect person-machine systems, and get an opportunity to apply what you learn; a unique and challenging quest. Human factors principles apply directly to many important Air Force jobs such as research concerning virtual reality displays, solutions to missile maintenance problems, and fighter cockpit design for the 21st Century.



BEHAVIORAL SCIENCE OPTION

The broad behavioral science track allows you great flexibility. After completing basic behavioral science courses, you can build a custom program that suits your individual needs and interests in the behavioral sciences from the variety of offerings in the Behavioral Science & Leadership Department and the Social Science Division.

Majoring in the behavioral sciences gives you a strong foundation for graduate studies and for effective performance in many careers. There are behavioral science majors in virtually every Air Force specialty! Here are just a few examples of jobs that specifically involve behavioral science skills:

- * Personnel Assessment: conducting selection research, designing new tests for hiring USAF personnel
- * Occupational Analyst: assessing human tasks, equipment used, training effectiveness, and job satisfaction
- * Counseling: providing vocational and mental health counseling to personnel
- * Analyst: conducting laboratory, field and simulator research on aircraft cockpit design and usability
- * Test and Evaluation: conducting test and evaluation of new systems, aircraft, and software

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	A J O 1	A d Ondi 2
	Academy Option 1	Academy Option 2
Beh Sci 352	AeroEngr 315	Astro 410
Bio 215	Beh Sci 331	Beh Sci Breadth Option 2
Econ 221	Beh Sci 332	Beh Sci Breadth Option 3
El Engr 215	Beh Sci 335	Beh Sci Breadth Option 4
English 211	Beh Sci 336	Beh Sci Track (CHD/HF/BS) Option 1
Engr Mech 120	Beh Sci Breadth Option 1	Beh Sci Track (CHD/HF/BS) Option 2
Soc Sci 112	Engr Sys Option	Beh Sci Track (CHD/HF/BS) Option 3
History 202	Law 310	Beh Sci Track (CHD/HF/BS) Option 4
Mgt 210	MSS 311	English 411
Physics 215	Math 300	MSS 411
Pol Sci 211		Philos 310

BEHAVIORAL SCIENCES (Beh Sci) Offered by the Department of Behavioral Sciences and Leadership.

Beh Sci 110. An Introduction to Behavioral Sciences and Leadership. This course provides an introduction to the scientific study of human behavior at the individual level, addresses fundamental knowledge about living and working in small groups (such as families or military units), and introduces the student to sociological and anthropological perspectives on the structure and function of larger groups. The course also provides an introduction to the study of leadership with particular emphasis on multiple perspectives for analyzing leadership situations so cadets can better understand and enhance individual and group performance. The course makes extensive use of experiential exercises that reinforce psychological principles and leadership skills that complement basic concepts.

Beh Sci 311. Advanced Topics in Leadership. This course goes beyond the initial exposure to leadership in Beh Sci 110 by exploring leadership as a scientific study and will be combined with experiential exercises, case studies, and student projects that allow students to form a deeper understanding of leadership. Students will gain practical leadership knowledge and skills that will have direct benefits as cadets and future officers.

Beh Sci 331. Basic Research Methods and Statistical Tools. Introduces the integrated

approach to statistics and experimental psychology. Topics covered include basic research design, APA research report writing, SPSS data analysis, descriptive measures, hypotheses testing, and prediction models. Includes research projects developed by the cadets on topics of interest for presentation.

Beh Sci 332. Advanced Research Methods and Statistical Tools. Continues the integrated approach to statistics and experimental psychology, extending cadet experience into more complicated experimental designs. Advanced multivariate designs and statistical procedures are learned and applied in psychology and human factors experiments.

Beh Sci 335. Experimental Psychology I. This course is the first in a two-course sequence designed to introduce cadets to various topics in experimental psychology. Adopts a historical approach by tracing the flow of experimental psychology from its early roots in the 19th century through to contemporary times. Includes an introduction to psychophysics, sensation and perception, biopsychology, and developmental process.

Beh Sci 336. Experimental Psychology II. This course is the second in a two-course sequence designed to introduce cadets to various topics in experimental psychology. Continues to trace the historical development of experimental psychology through to contemporary times. Includes an introduction to human and animal

learning processes, cognition, psychometrics, as well as applied topics in clinical psychology, social psychology, and industrial/organizational psychology.

Beh Sci 340. Marriage and Family. This course examines courtship, marriage, and family in American culture. Emphasis is placed on the strains inherent in the dynamic interaction of gender, work, and family roles with special attention paid to the situation of military families and possible impacts on mission. This course uses lecture/discussion, films, student reports, and visiting experts. Practically, this course is an important step in preparing the graduates for their own marriages as well as providing some understanding of the effect of family factors on the productivity of military members.

Beh Sci 350. Cultural Anthropology. Examines seven major topics of cultural anthropology from a unique problem-based approach: culture and meaning, the meaning of progress, the social construction of reality and identity, language and symbolic meaning, the function of ritual, social construction of hierarchy, and violent conflict. Accordingly, the course looks at human development from the earliest time to the present by employing archeology, physical anthropology (biological/ecological development), and both ethnology (comparative and historic study of cultures) and ethnography (study of specific cultures), to understand the learned practices of diverse groups of people. This comparative approach is geared to allow students to become dynamic "cultural practitioners" instead of simply cultural recipients. Material on ethnographic fieldwork, linguistics, kinship, social organization, and contemporary applications of anthropology will be examined.

Beh Sci 352. Social Psychology. This course provides an introduction to social psychology and behavior sciences. Social psychologists seek to understand the nature and causes of individual behavior in social situations. In other words, social psychology explains how the average person reacts to various social pressures. Topics covered include social perception, attitudes, prejudice and discrimination, interpersonal attraction, social influence, prosocial behavior, aggression, groups and personality. From a practical standpoint, this course explains how and why people react to the world and other people as they do. Leadership implications are discussed.

Beh Sci 360. Sociology. Sociology is the systematic study of human social behavior and groups. Racism, sexism, social stratification, bureaucracy, religion, education, and socialization are but a few of the topics covered. Classroom discussions and interaction with others are stressed throughout the course. Practically, this course teaches cadets how to examine what is "really" going on around them.

Beh Sci 370. Cognitive Psychology. This course provides an overview of cognitive psychology. Human cognitive processes are examined from an information processing approach, and will include topics such as perception, attention, memory, language processing, judgment and decision-making, and problem solving. Emphasis will be placed on practical applications that cadets can use to become a better student and officer.

Beh Sci 371. Aviation Psychology. This course focuses on human performance and manmachine design issues in military and civilian aviation. Through a series of seminars, the student will review psychophysiological effects of flight (visual, vestibular, and fatigue effects), investigate human performance during flight, discuss air controller and cockpit crew interaction, and review specific aircraft design issues from the human performance perspective.

Beh Sci 373. Introduction to Human Factors. This course examines the process, principles, and guidelines of human factors as they impact the design of systems used by people and provides an introduction to the Human Factors and Systems Design Option. Emphasizes the interaction between human capabilities and limitations, the task, and the environment, as they relate to performance.

Beh Sci 380. Theories of Personality. Examines major theories of personality including behavioral, psychoanalytic, humanistic and trait approaches. Theories are examined with respect to concepts of personality development, assessment techniques, research methodologies and applications to current issues.

Beh Sci 385. Sports Psychology. This course examines the science of psychology and the study of behavior as it relates to sports. Topics include the influence of personality, anxiety/arousal, motivation, aggression, attention/concentration, cognition/imagery, leadership, and other social-psychological dynamics on sport performance. Focus will be on the study of these concepts through reading, discussion, observation and experimentation.

Beh Sci 420. Educational Psychology and Human Development. This course focuses on psychological development of the individual from conception to adulthood, examining the processes of change and the influences affecting the developing person including motor, language, social and intellectual skills across the lifespan. The formal structure and content of the field of educational psychology will be reviewed. Students are required, individually or in pairs, to develop original classroom assignment projects reflecting their knowledge of both educational psychology and human development. Students will work to design and present a short course for faculty on enhancing teaching effectiveness. This unique course allows students to learn by doing.

Beh Sci 440. Lifespan Development. This course examines how people develop physically, psychologically, socially, and cognitively from birth to death. It explores changes that are universal and changes that are unique to specific individuals. Developmental theories explaining these changes are presented. The course also focuses on the social context of development: "What is the impact of income, education, ethnicity, race, sex, culture, and historical time period on developmental outcomes?"

Beh Sci 450. Biopsychology. Examines the biological and neurophysiological foundations of human and animal behavior. Emphasis is on central nervous system mechanisms which mediate processes such as learning and memory, language, intelligence, sleep and arousal, reward and punishment, and human mental disorders. Special consideration is given to sensation and perception and topics which impact human factors design concerns.

Beh Sci 471. Engineering Psychology. This advanced course examines cognitive and human performance theory with the aim of improving the design of human-machine interactions. The course presents a functional model of human information processing with an emphasis on how people attend, perceive, think, remember, decide, and respond within a human-machine context. Applied topics such as flight control and navigation, stress, and human error are examined. Emphasis is placed on designing systems that are compatible with the way humans process information.

Beh Sci 473. Human Factors in Systems Design. This capstone course emphasizes the role and responsibilities of the human factors engineer in the design and evaluation of systems. The course uses a combination of group, individual, and in-class design projects to explore the systems design process. Particular attention is given to human characteristics and their effects on system performance.

Beh Sci 477. Industrial/Organizational **Psychology.** Using concepts from several disciplines of psychology, this course provides a systematic study of job related behavior and an overview of the behavior of individuals at work by exploring work behaviors and related variables as part of a complex open system. Topics in personnel (industrial) psychology include analyzing jobs, matching individuals to jobs via selection or socialization, and training and performance evaluation. The second half of the course concentrates on the social context of work, and investigates motivation, job satisfaction, leadership, organization theory, personality, stress, and absenteeism and turnover.

Beh Sci 485. Abnormal Psychology. Building upon students' understanding of personality and individual differences, this course examines the development, nature, and treatment of mental disorders. Special emphasis is placed upon understanding the psychosocial context of maladaptive behavior.

Beh Sci 490. Individual and Group Counseling. Integrating material across the behavioral sciences, this course examines the helping process from theoretical and pragmatic perspectives. Emphasizes the application of effective interpersonal skills toward helping others in both individual and formal group settings.

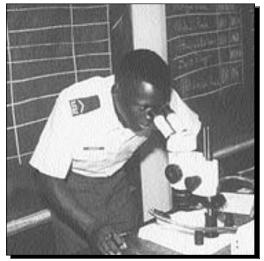
Beh Sci 495. Special Topics. Selected topics in the behavioral sciences. Recent courses have included: Accident Investigation, Virtual Reality, Paranormal Psychology and Psychological Operations.

Beh Sci 499. Independent Study. Research or practicum in a specific area of behavioral science. Conducted on a tutorial basis.

Biology Major



Are you interested in what makes your body function? Are you fascinated by the vast diversity of living organisms on this planet? Does the idea of decoding a strand of DNA interest you? If so, then the Biology Major is for you. This major is designed to promote the development of the cadet's natural scientific talents through a carefully planned program of academic instruction, practical laboratory experience, and individual research projects.



The Biology Major provides a multidisciplinary approach to the study of human performance in air and space, exercise, biomechanics, environmental sciences, and cutting-edge cell and genetic engineering. Some cadets pursue specialized areas of interest such as aviation and flight, human factors in aviation and space, athletics and sports performance, ecology, cell and molecular biology, or prepare for professional or advanced degrees.

The Biology Major is also very flexible. Cadets are not limited to a specific area of study and are free to tailor a program to meet their own interests. The Biology Major can complement many careers in the Air Force, or prepare you for one of several health professions careers (aerospace physiology, dental, medical, nursing, or physical therapy).

rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	Aero Engr 315	Academy Option 1
Bio 215	Bio 360	Academy Option 2
Bio 330	Bio 363	Astro 410
Chem 230/233	Bio 380	Bio 331
Econ 200	Bio Option	Bio 480
El Engr 215	Civ Engr 210	Bio Human Option
English 211	Geog 310	Bio Option
Engr Mech 120	Law 220	Bio Option
For Lang 1	Math 300	Bio Option
For Lang 2	Mgt 200	English 411
listory 202	Philos 310	MSS 400
Physics 215 Pol Sci 211	Scientific Breadth Option	Scientific Breadth Option

BIOLOGY (Bio)

Offered by the Department of Biology.

Bio 215. Introductory Biology with Lab. An overview of biological systems, their structure and function, and the concepts and vocabulary essential to understanding biology today. Course content includes recent biological advances ranging from genetic engineering to human health and performance; from a survey of organisms to integrated global ecology and environmental science. Impacts on personal decision making as well as on Air Force planning and operations are included. Laboratory investigations highlight the scientific method and basic biological concepts.

Bio 260. Strategies for Health. Provides knowledge, insight, and decision-making skills needed by individuals in setting and reaching personal health goals as USAF officers. Topics introduced include nutrition, physical fitness, environmental health, mental health, stress management, sexuality, disease prevention/self-care, and special health issues affected by global travel. Students will learn how to improve their overall health, as well as those they will supervise during their careers. This course is suitable for cadets majoring in any academic discipline, including divisional majors or other programs.

Bio 320. Biomechanics. A comparative study of the physical, anatomical, mechanical, and physiological basis for motion in a variety of model organisms. Physics and mechanical engineering concepts are applied to describe, investigate, and compare the ways organisms initiate and control movement. Special emphasis is given to human motion and exercise.

Bio 330. Zoology. An integrated study of the principles of invertebrate and vertebrate zoology presented with a phylogenetic approach. Examines the behavior, ecology, morphology, physiology, reproductive biology, classification, and evolutionary relationships of animals. Functional aspects of respiration, circulation, osmoregulation, excretion, metabolism, and thermoregulation are highlighted through comparisons within and among animal groups. Through laboratory exercises students will learn and recognize structural, physiological, and evolutionary features of selected animals.

Bio 331. Botany. An integrated study of the biology of plants is presented from molecular to community levels of organization. Course content is organized into five units of the study: the plant system, plant anatomy and morphology, plant physiological ecology, plant reproductive biology, and plant evolution and classification. Although this course focuses primarily on seed plants, other programs such as fungi, algae, and lichens are explored. The study of plants is important because of their relevance to nutrition, drugs, celebration, and objects from daily life such as paper products, clothing, furniture, and flowers. A botanical perspective enriches an understanding of the natural world. Laboratory and fieldwork is required.

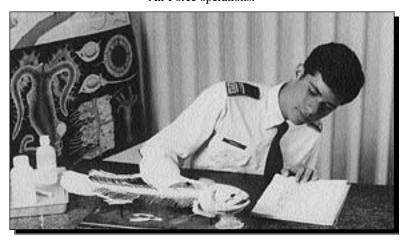
Bio 345. Aerospace Physiology. What are the physiological reasons why the warrior succeeds or fails in combat? What causes a perfectly good pilot to "BUY THE FARM" in a perfectly good aircraft? How can life-support systems or physical conditioning improve pilot performance? How do astronauts overcome the effects of prolonged space flight? These and many other questions on how humans, machines, and the environment interact to influence the aircrew member, astronaut, and warrior's ability to fly, fight, and win will be answered.

Bio 350. Biology and Space Exploration. This course introduces the environment of space as it relates to life. A central focus is the effect of space flight on organisms, especially humans, including such topics as radiation, microgravity, the response of various physiological systems, life support, and crew performance. The course also explores the science behind building long-term colonies and "terraforming" planets, as well as the search for other life in the universe.

Bio 360. Cell and Molecular Biology. A comprehensive examination of the cell, the fundamental unit of life. Emphasis is placed on eukaryotic cells, cellular organization and processes, and how the cell structure and activity ultimately determine structures and function at the organismal level. Fundamental cellular concepts will be illustrated and reinforced through discussion of gamete formation, specialized cells, eukaryotic-cell evolution, immunology, natural and man-made drugs and toxins, cancer, and AIDS.

Bio 363. Genetics. A comprehensive study of the inheritance patterns of individuals and populations, including the mechanisms by which these patterns are expressed and changed. Additional emphasis is placed on current technologies, including genetic engineering, their role in exploring the nature of life, and the ethical burden this has placed on society.

Bio 380. Principles of Ecology. A study of the fundamental interrelationships between organisms and their environments, emphasizing energy flow through ecosystems, biogeochemical cycling, and population dynamics. Emphasis is also placed on how human activities affect the quality of life and natural world. Case studies include the impact of environmental concerns on Air Force operations.



Bio 410. Anatomy and Physiology: Sensory and Motor Integration. An introduction to human sensory and locomotory systems via experimentation and dissection of the human cadaver, with dissection emphasized. The course focuses on feedback mechanisms and the integration of organ systems for homeostasis and voluntary control. The following organ systems will be studied in detail: integumentary, skeletal, muscular, and nervous/sensory.

Bio 430. Vertebrate Zoology. A study of evolutionary origins, adaptations, characteristics, natural history, and classification of major vertebrate groups: Fish, Reptiles, Amphibians, Mammals, and Birds.

Bio 431. Microbiology. This course is a presentation of classical microbiology and how it relates to our daily lives, both in and out of the military. The course has two primary goals: first,

to provide a foundation of fundamental knowledge of microorganisms and an appreciation for the diversity of microscopic life that affects us; second, to promote independent thought and problem solving skills through experimental analysis of microorganisms and scholarly research on a topic of medical and/or military importance relating to microorganisms.

Bio 440. Anatomy and Physiology: Visceral Systems Integration. An introduction to systems physiology via experimentation and dissection of the human cadaver, with experimentation emphasized. The course focuses on feedback mechanisms and the integration of organ systems for maintenance of homeostasis. The following topics will be studied: autonomic nervous control, digestion, cardiovascular regulation, respiration, endocrinology, nephrology, reproduction, and immunology.

Bio 464. Molecular Biology Methods. A practical study of the methods and techniques used in the modern molecular biology and genetic engineering laboratory. The class will focus on bacterial genetics, plasmid biology, analysis of nucleic acids, recombinant DNA construction, bacterial transformation, and polymerase chain reaction.

Bio 480. First-Class Biology Seminar. A survey of experimental biology through seminars, presentations of journal articles, and discussions. Emphasis is on student participation and exploring areas of current biological importance.

Bio 481. Applied Ecology. Lecture/lab study. Lecture includes biotic and abiotic inputs and controls of various ecosystems. Lab exercises introduce survey techniques used in field studies. Emphasis is placed on environmental issues that are of special interest to Air Force personnel.

Bio 495. Special Topics. Selected topics in the biological sciences.

Bio 499. Independent Study. Individual research or tutorial study in the biological sciences under the direction of a faculty member. Emphasis is on using pertinent biological literature and conducting laboratory research.

Chemistry Major

he Chemistry Major is recommended for those interested in chemical, biochemical, or materials science research or applications. It provides fundamental knowledge in analytical, inorganic, organic, and physical chemistry and allows the cadet to apply this fundamental knowledge to biochemical and materials science applications as well as advanced study of any of the basic areas. The major is designed to prepare cadets for a junior officer position in research, development, or graduate or medical/dental education. It emphasizes the use of the laboratory methods for reinforcement of lecture material and individual research projects. There are three chemistry tracks from which the cadet can choose, and each track is approved by the Committee on Professional Training of the American Chemical Society. The tracks are: chemistry, biochemistry, and materials science. The materials science track is an interdisciplinary program with additional emphasis on applying chemical concepts to structural, electronic, and optical uses. Cadets who successfully complete an individual track are awarded the degree of Bachelor of Science in Chemistry. The suggested course sequence for each class year is listed below for each track:



SUGGESTED COURSE SEQUENCE:

Physics 215 (all) Soc Sci 112 (all)

3rd Class Year 2nd Class Year Beh Sci 110 (all) Academy Option 1 (all) Bio 215 (all) AeroEngr 315 (Chem) Chem 222 (Mat Sci) Bio Option 1 (Chem/Biochem) Chem 233 (all) Bio Option 2 (Chem/Biochem) Chem 234 (Biochem/Chem) Chem 222 (Chem/Biochem) Chem 243 (all) Chem 335 (all) Chem 244 (Biochem/Chem) Chem 336 (all) Civ Engr 210 (all) Chem 345 (all) English 211 (all) Chem 465 or 440 (Mat Sci) History 202 (all) Econ 200 (all) Math 243 (all) El Engr 215 (all) Math 245 (Mat Sci) Engr Mech 330 (Mat Sci)

Engr Mech 340 (Mat Sci) Law 220 (all) Math 300 (all) Mgt 200 (all) Philos 310 (Chem) Physics 393 (Mat Sci) Pol Sci 211 (Chem/Biochem) 1st Class Year

Academy Option 2 (all) AeroEngr 315 (Biochem/Mat Sci) Astro 410 (all) Basic Sciences 300/400 Option 1 (Chem) Basic Science 300/400 Option 2 (Chem) Chem Concentration 1 (Chem/Biochem) Chem Concentration 2 (Chem/Biochem) Chem Concentration 3 (Chem) Chem 431 (all) Chem 434 (Chem/Mat Sci) Chem 440 or 465 (Mat Sci) Chem 445 (all) Chem 481 (Biochem) Chem 482 (Biochem)

English 411 (Mat Sci) Engr Mech 440 (Mat Sci) MSS 411 (all) Philos 310 (Biochem/Mat Sci) Pol Sci 211 (Mat Sci)



CHEMISTRY RESEARCH: All cadets in the chemical sciences are strongly urged to participate in research. This provides an undergraduate with the opportunity to gain first hand experience in scientific research methods by working with one or more members of the faculty. Cadets use modern techniques and computer-controlled instrumentation. Each cadet initiates the process by discussing research possibilities with faculty members on an individual basis.

The Air Force chemist plans and conducts research in physical, organic, inorganic, analytical or biochemistry and various other subareas of chemistry, and engages in continuous development and modification to improve performance and suitability of products and of production processes. The chemist manages programs, projects, and activities involving chemistry, chemical engineering, or biology. Individuals must be recommended by the Department of Chemistry. Air Force opportunities for chemistry majors include chemist, staff scientist, nuclear research officer, systems program manager, research and development officer, environmental engineer, clinical laboratory officer, and health physician or dentist. In addition to scientifically-related fields, chemistry majors are competitive for careers as pilots, navigators, maintenance officers, space and missile operations officers and other operational career fields.



CHEMISTRY (Chem)

Offered by the Department of Chemistry.

Chem 141. Applications of Chemistry I. Fundamental applications of chemistry with emphasis on the chemical concepts underlying those applications. Topics include atomic and molecular structure, electronic structure, oxidation-reduction reactions, stoichiometry, chemical bonding and structure, chemical analysis, environmental chemistry, and special topics. Chemical principles are taught within the framework of Air Force Applications. Laboratories emphasize both quantitative and qualitative analysis with computer-interface data acquisition and analysis.

Chem 142. Applications of Chemistry II. A continuation of Chemistry 141. Topics include gas laws, thermodynamics, acids and bases, electrochemistry, kinetics, chemical equilibrium, biochemistry and special topics. Chemical principles are taught within the framework of Air Force applications. Laboratories emphasize both quantitative and qualitative analysis with computer-interface data acquisition and analysis.

Chem 222. Analytical Chemistry. Lecture and laboratory experience in quantitative analysis using both classical wet techniques and modern instrumentation. Topics include wet chemical methods, chromatography, spectroscopy, electrochemistry, and other advanced techniques.

Chem 230. Introductory Organic Chemistry. Introduction to the fundamentals of organic chemistry. Topics include: nomenclature of organic compounds; stereochemistry; reaction mechanisms; structures and functions of organic functional groups; introduction to carbohydrates, lipids, amino acids and proteins; and nucleic acids; basic aspects of polymer chemistry.

Chem 233. Organic Chemistry I. Classification and naming of organic compounds, synthesis and reactions of organic functional groups, stereochemistry, introduction to resonance, spectroscopy, and reaction mechanisms.

Chem 234. Organic Chemistry II. Continuation of the reactions of aliphatic and aromatic compounds and reaction mechanisms. Introduction to carbohydrates, polynuclear aromatics, heterocyclic compounds, amino acids and proteins, and multistep syntheses.

Chem 243. Organic Chemistry I Lab. Experiments in the preparation, purification and identification of representative organic compounds. Introduction to chromatography, infrared spectroscopy, and nuclear magnetic resonance spectroscopy as applied to the identification of organic compounds.

Chem 244. Organic Chemistry II Lab. This is a continuation of Chem 243 and includes

applications of infrared, proton and carbon magnetic resonance, mass spectra, and chromatographic analysis of organic materials prepared in the laboratory.

Chem 325. Space Chemistry. This course will examine the role chemistry plays and will play in our efforts to effectively utilize space. Topics may include propulsion chemistry, chemical processes and chemical product applications, and other subjects of current interest.

Chem 335. Physical Chemistry I - Thermodynamics and Equilibria. This course covers the fundamentals of chemical thermodynamics and equilibria involving gases, liquids, and solutions, the analysis of phase equilibria, chemical kinetics, and an introduction to quantum theory and spectroscopy.

Chem 336. Physical Chemistry II - Quantum Theory and Its Application. This course expands on the details of quantum theory and spectroscopy, and covers the topics of statistical thermodynamics, computational, and solid-state chemistry.

Chem 345. Physical Chemistry I Lab. Laboratory measurement of physical properties including thermodynamics of liquids and gases; thermochemistry of reactions; phase and chemical equilibria; colligative properties. Precision of measurement, statistical treatment of data, and graphical techniques are emphasized.

Chem 381. Chemistry of the Environment. Discussion of nature, chemistry and alteration of the environment. Areas of study include atmospheric and water pollution, waste disposal, biochemistry, energy alternatives, and special topics of current or regional interest. Emphasis on understanding the chemical principles and reactions involved in protecting and improving our environment.

Chem 431. Theoretical Inorganic Chemistry. Theoretical approach to atomic structure, covalent bonding and molecular structures; ionic compounds; coordination chemistry to include organometallics; boron chemistry; inorganic synthesis; transition metals chemistry and bioinorganics; general survey of the periodic table.

Chem 432. Systematic Inorganic Chemistry. Applications of Chem 431 with emphasis on a systematic study of the behavior of chemical elements and theoretical inorganic compounds. Chemistry of transition metals, organometallics, boron, bio-inorganics, fluxional molecules, kinetics and mechanisms of inorganic reactions and special topics.

Chem 433. Advanced Organic Chemistry. Chemical bonding and molecular structure; molecular orbital theory, aromaticity. Structure-

reactivity, kinetics, mechanisms, and linear free energy relationships. Concerted reactions; conservation of orbital symmetry, frontier molecular orbitals, photochemistry. Selected synthetic methods; nucleophilic carbon species, carbonyl compounds. Principles of stereochemistry; asymmetric synthesis. Interpretation of nuclear magnetic resonance spectra, 2D nuclear magnetic resonance.

Chem 434. Biochemistry. Chemistry of the life processes. Topics covered include the chemistry of biomolecules (carbohydrates, lipids, amino acids, and nucleotides); energetics and metabolic control; enzymes; mechanisms and kinetics; intermediary metabolism, biosynthesis and function of macromolecules including DNA, RNA, and proteins; introduction to biotechnology and recombinant DNA techniques.

Chem 435. Advanced Physical Chemistry. Development of molecular quantum mechanics and its application to molecular spectroscopy and chemical reaction dynamics. Spectroscopy topics include rotational, vibrational, and electronic spectroscopy. Chemical reaction dynamics study will emphasize theoretical calculations for reactions of Air Force interest using the best available theoretical chemical methods.

Chem 440. Polymer Chemistry. An introduction to polymer chemistry. Topics include discussions on the interrelations between molecular and gross physical properties; polymer structure; methods of polymerization; organic, inorganic, and biochemical polymers; polymer development; and Air Force applications for polymers.

Chem 445. Advanced Laboratory Techniques. This course is designed to illustrate advanced laboratory techniques in inorganic, organic, analytical, and physical chemistry. Experiments include preparation, purification, identification, and analysis of representative organic and inorganic compounds.

Chem 453. Instrumental Methods of Chemical Analysis. Advanced theory and application of modern analytical instruments for chemical analysis. Emphasis on theory as applied in laboratory instrumentation. Topics include ultraviolet, visible, infrared absorption and emission spectroscopies; nuclear magnetic resonance and electron paramagnetic resonance spectroscopy; chromatography; thermal analysis methods; and electrochemical techniques.

Chem 465. Chemistry of Advanced Materials. Chemical studies in topics that start with quantum mechanics models, then include materials for energy storage, electronics, structures, optics, and glasses. Chemistry 465 is a course for the Materials Science Track majors, developed to emphasize physical chemistry fundamentals, the interface between molecules and materials, and

laboratories on synthesis and characterization of materials.

Chem 481. Chemistry of Biomolecules. Chemistry of living organisms emphasizing the roles played by biomacromolecules and macromolecular assemblies. Topics covered include an introduction to primary literature in biomedical research; cells and organelles; nucleotides and nucleic acids; amino acids; peptides and proteins; the central dogma (replication, transcription, and translation); DNA recombination; regulation of transcription; and recombinant DNA technology. Laboratory experiments emphasize recombinant DNA technologies as applied to production and isolation of recombinant viruses and proteins.



Chem 482. Macromolecular Biochemistry.

Chemistry of living organisms emphasizing the central metabolic processes and the enzymes that run them. Topics covered include a continuation of the introduction to primary literature in biomedical research; enzyme kinetics and mechanisms; biological membranes; bioenergetics; detailed examination of carbohydrate metabolism; oxidative phosphorylation; introductory examination of amino acid, lipid and nucleotide metabolism; control of metabolism by hormonal regulation. Laboratory experiments center upon projects integrating, applying and extending all of the techniques acquired in Chem 481.

Chem 495. Special Topics. Selected topics in chemistry.

Chem 499. Independent Study. Individual research under the direction of a faculty member. Includes use of chemical literature.

Civil Engineering Major





Civil engineering is one of the broadest of the engineering disciplines, encompassing many interdependent technical specialties. As a civil engineer, you plan, design, and supervise the construction of a wide variety of facilities, such as space stations and launching facilities, offshore structures, bridges, buildings, tunnels, highways, transit systems, dams, airports, irrigation projects, distribution facilities for water, and collection and treatment facilities for wastewater and hazardous wastes.

You will use technology's newest applications. Civil engineers are leading users of state-of-the-art computer methods in design, construction, project scheduling and cost control. Civil engineers are problem solvers, meeting the challenges of pollution, a deteriorating infrastructure, traffic congestion, energy needs, floods, earthquakes, urban development and community planning. As you develop your skills, you can move into engineering management, oversee the completion of entire projects, and work closely with architects, owners, contractors, government officials and others involved in all aspects of construction.

You will be responsible for community development and improving the quality of life. Your opportunity for creativity is unlimited since most projects are custom designed. One of the great rewards of civil engineering is the personal satisfaction derived from the creation of enduring engineered structures which make our communities better places in which to live and work

SUGGESTED COURSE SEQUENCE:

3rd Class Year 2nd Class Year 1st Class Year Bio 215 Academy Option 1 Aero Engr 315 Civ Engr 210 Bas Sci Option Academy Option 2 Civ Engr 330 **Astro 320 *Civ Engr 351 Econ 200 Civ Engr 361 Civ Engr 405 English 211 Civ Engr 362 Civ Engr 474 Civ Engr 372 Engr Mech 120 Civ Engr 480 Engr/Basic Science Option Civ Engr 373 Civ Engr 488 Civ Engr 390 Civ Engr Design Option 1 History 202 Math 243 **El Engr 231 Civ Engr Design Option 2 Math 245 Law 220 English 411 **Math 356 Mgt 200 Engr 311 Philos 310 Physics 215 MSS 400 Social Sci 112 Pol Sci 211 * Taken summer before second-class year

Like the civil engineering profession, the Air Force civil engineering career field is also broad, including architects, electrical engineers, mechanical engineers, environmental engineers, and civil engineers. Typically, an Air Force civil engineering officer can expect to work at both base and command level jobs. The civil engineer at base level is responsible for the construction and maintenance of facilities; buildings, roads, airfield structures, utility distribution systems,

** Core substitute

waste disposal systems; and is responsible for environmental management, to include pollution prevention and hazardous waste clean-up. Accordingly, Air Force civil engineering requires many specialties. Your tasks may include technical design, project planning and programming, and possibly managing the maintenance work force of civilian and military personnel. At the command level, your expertise is required to plan, manage, and direct the civil engineering efforts on a command-wide basis.

Do you like science and mathematics? Are you curious about how things work and how to make them better? Do you want a major dedicated to improving the quality of life for everyone? Then perhaps civil engineering is the major for you...to complement your flying career or to give you a satisfying lifelong career. The curriculum at USAFA provides a well-balanced program stressing the fundamentals of the civil engineering profession. The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Upon graduation you earn a Bachelor of Science in Civil Engineering, a BSCE.

The operational goals of the Civil Engineering program include educating future Air Force officers who possess a breadth of integrated, fundamental knowledge in the basic sciences, engineering, humanities, and social sciences, with a depth of knowledge in Civil Engineering and broad knowledge in Environmental Engineering. The program strives to provide its students with the skills necessary to communicate effectively, demonstrate leadership, work effectively with others and develop into independent, lifelong learners. The program challenges students to apply their knowledge and skills to frame and solve Air Force civil and environmental engineering problems and understand their ethical and professional responsibilities as embodied in the United States Air Force core values. The civil engineering program is one of the few educational experiences that equips its students with the skills needed to function effectively in contingency operations.

Graduates of the Civil Engineering program will demonstrate the ability to apply the fundamental concepts of civil engineering to solve engineering problems and have developed laboratory skills to include the design of experiments, the comprehension of procedures, and the recording, and analysis of data. Graduates will possess engineering design capabilities, including construction processes and the ability to use contemporary civil engineering analysis, design, and testing tools. They will have a command of written and oral communication skills, accompanied by a deep knowledge of their ethical and professional responsibilities as engineers. Graduates will be equipped with a depth of knowledge and skills in civil engineering and a breadth of knowledge and skills in environmental engineering, computers, mathematics, and other disciplines, which allows graduates to effectively identify and solve the types of complex, multidisciplinary problems they will face as Air Force civil and environmental engineers. The educational experience gained in the program highlights the benefits and the skills needed to engage in life-long learning. Our curriculum enables graduates to become effective multidisciplinary team members, while developing the skills to be an independent learner who knows when to seek help. The broad-based educational experience offered by the civil engineering program gives graduates a knowledge of their role as Air Force engineering officers in our global society and the knowledge of contemporary, economic, military, ethical, environmental, and engineering issues.

FIELD ENGINEERING AND READINESS LABORATORY

An innovation within the Department of Civil and Environmental Engineering is the Field Engineering and Readiness Laboratory. Cadets majoring in civil engineering have the opportunity to experience "hands-on" construction as part of Civil Engineering 351 taken between their third- and second-class years. The Field Engineering and Readiness Laboratory allows cadets to develop an engineering "feel" for the capabilities of construction equipment and an appreciation of operator skills through hands-on experience constructing bridges, roadways, a wood-frame building, and operating heavy construction equipment, such as bulldozers, backhoes, and excavators. Cadets then apply theoretical principles to these construction projects in their follow-on civil engineering courses. This field engineering experience provides engineers with the ability to more directly apply their theoretical knowledge in solving real world problems.

CIVIL ENGINEERING (Civ Engr)

Offered by the Department of Civil and Environmental Engineering.

Civ Engr 210. Air Base Design and Performance. Broad principles of engineering design (including technical, ethical, economic and socio-political considerations) applied to the environment, infrastructure and combat support requirements for air bases in peacetime, humanitarian relief, small scale contingency, and combat operations. Guided by an integrated decision-making and systems-design approach, cadets solve projects based on real Air Force problems to integrate the course material and their personal experience. Topics covered were validated based on survey of engineers, educators and operational Air Force officers. The topics include: environmental impact analysis, (land use planning, environmental quality and airspace issues), infrastruture analysis and design (airfields, utilities and facilities) and combat support with emphasis on beddown, force protection planning and host nation support consideration.

Civ Engr 215. Computer Applications for Civil Engineers. Application of commercially available computer based tools for solving common types of Civil Engineering problems. Mechanical drawing, using state-of-the-art computer-aided drafting (CAD) software, includes presentation and working drawings. Use of spreadsheet and relational database software for the solution of simultaneous equations and linear programming with an emphasis on information input, data handling, and professional output.

Civ Engr 330. Elementary Structural Analysis. Static analysis of determinate structures: stresses and deformations in beams, trusses, and frames.

Civ Engr 351. Civil Engineering Practices - Field Engineering. Operational visit to an Air Force base and a civil engineering wartime training site. Plane surveying to include leveling, closed traversing, crash surveys and global positioning surveys. Introduction to construction materials, design of concrete mixes, and hands-on construction using metal, timber, asphalt and concrete and working knowledge of environmental systems. Cadets will construct various projects that they will design in later Civil Engineering courses.

Civ Engr 352. Design and Construction of the Concrete Canoe. The design and construction of the concrete canoe is an integration of several course experiences and acts as a test of the understanding of fundamental concepts in concrete, structural design, hydraulics, and computer applications. It allows cadets to learn new skills in project management, design, concrete technology, material testing and physical construction. Cadets will use AutoCAD to complete three-dimensional modeling, SureTrak to develop and track the progress of the project and other structural analysis packages to determine forces within the canoe. Extensive time will be spent in the laboratory testing the properties of the concrete mix design and the strength of the reinforcement materials. In addition, hull designs will be tested in the open channel flow tank using scale models. Cadets will be responsible for the construction and the procurement of all materials required for construction of the canoe upon completion of the design.

Civ Engr 361. Fundamental Hydraulics.

Application of the principles of incompressible fluid mechanics. Topics include: fluid properties, manometry, forces on submerged bodies, open channel flow, and conduit flow. Impulsemomentum, energy methods, Hardy-Cross method for balancing flows in distribution systems and sewer design are also covered.

Civ Engr 362. Introduction to Environmental Engineering. Fundamental theory, principles, and preliminary design of unit operations in environmental engineering. Topics include air and water pollution, municipal and hazardous waste treatment, water chemistry, microbiology, mass balance, reactor theory and kinetics, and physical process theory.

Civ Engr 368. Hazardous Waste Management and Contaminant Transport. Combines environmental engineering toxicology and risk management to provide tools for cadets to: identify environmental impacts and health problems associated with a variety of activities and substances (e.g., hazardous waste disposal), address groundwater hydraulics and contaminant transport, develop site selection criteria for potentially hazardous facilities, and determine environmental management priorities. The engineering planning and analysis associated with handling, storage, treatment, transportation, and disposal of hazardous wastes will be covered.

Civ Engr 369. Introduction to Air Pollution. An in-depth introduction into air pollution covering such topics as the causes, sources, and effects of air pollution. Legislative standards (ambient and source) for pollutants, basic meteorology, air pollution instrumentation, and gas flow measurements, design and operating principles of different control technologies and dispersion modeling will be addressed. The course work will involve several laboratory exercises.

Civ Engr 372. Behavior and Analysis of Structures. Behavior and analysis of statically determinate and indeterminate beams, frames and trusses. Displacement calculations using virtual work. Analysis of indeterminate structures by consistent displacements and moment distribution. Introduction to general stiffness method. Computer analysis projects.

Civ Engr 373. Behavior and Design of Steel Members. Behavior of structural steel beams, columns and connections, and frames; using the Load and Resistance Factor Design method. Design for tension flexure, shear, compression, and combined loads. Design of bolted and welded steel connections. Design project.

Civ Engr 390. Introduction to Soil Mechanics. Engineering properties of soils, soil classification, permeability, consolidation, compaction, shear strength, and applications to engineering design. Soils laboratories, and reports.

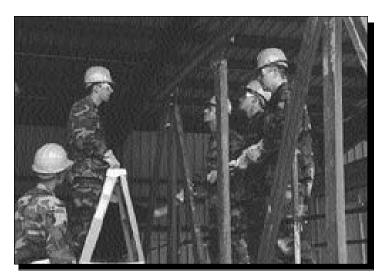
Civ Engr 405. First-Class Seminar. A course designed to give civil engineering majors the opportunity to synthesize and apply the concepts they have learned throughout their undergraduate education. Topics discussed will include those that cadets may encounter in the Air Force after graduation.

Civ Engr 463. Wastewater Treatment Plant Design. Design of facilities for physical, chemical, and biological treatment of wastewater, and treatment and disposal of sludge. Coverage of advanced wastewater treatment and land treatment systems. Laboratory exercises analyzing raw sewage with data being used for the design processes.

Civ Engr 464. Architectural Design. Design of a single-family residence. Uses computer-aided-design and drafting (CADD) software in developing design: site plan, functional layout, framing, energy and electrical planning, aesthetic

design, landscaping, and mechanical planning. Produces set of design working drawings by end of course.

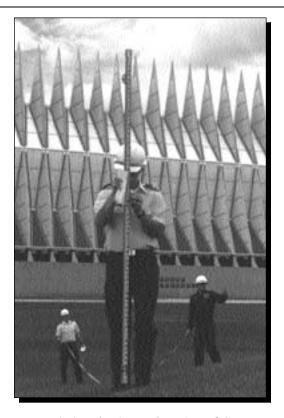
Civ Engr 467. Water Treatment Principles and Design. Design of unit operations for coagulation, sedimentation, filtration and disinfection for treatment of drinking water. Introduces the chemistry of drinking water treatment processes. Use of unit operations to design treatment solutions to contemporary environmental problems. Topics include the design of ion exchange, reverse osmosis, chemical precipitation, and selected hazardous waste disposal problems.



Civ Engr 468. Solid and Hazardous Waste Facilities Design. Design and analysis of solid and hazardous waste management systems including collection, transport, processing, resource recovery, and disposal (e.g., the design of landfills and incinerators). Hazardous waste regulations, treatment and site cleanup are addressed.

Civ Engr 469. Design of Air Pollution Controls. Modeling and predicting the effects of air pollution, and the design of the facilities for air pollution control. The design of electrostatic precipitators, cyclones, bag houses and other methods for the control of air contaminants are addressed.

Civ Engr 473. Structural Design. Design of a multi-story steel and reinforced concrete building, including structural frame, floor and roof system, and foundation. Computer-aided analysis and design.



Engr 474. Behavior and Design of Concrete Members. Properties of reinforced concrete. Behavior and ultimate strength design of reinforced concrete beams, slabs, columns, and footings. Design for flexure, shear, compression, bond and anchorage.

Civ Engr 480. Construction Management and Administration. This First-Class capstone design course takes students from discipline specific design to integrated project construction. A semester project will serve as a culminating experience and will be based on work designed by cadets in prior or concurrent courses. In Civ Engr 480, cadets will learn how to review and prepare the project for construction through the incorporation of engineering standards and consideration of realistic issues including economic, constructability and environmental aspects as well as sustainability and health and safety constraints. Throughout the planning, estimating and project investigation stages, cadets will consider impacts of ethical, social and political concerns.

Civ Engr 485. Construction Project Management. This course emphasizes the methods and materials of construction as well as the management practices required to run a successful construction project. Topics include project planning, scheduling, cost estimating and

control, field engineering, labor relations, and safety. A semester project, in the form of a detailed study of a major construction project in the local area, will complement the classroom experience.

Civ Engr 488. Pavement Design and Transportation. Fundamental theory and design principles of both flexible and rigid pavements. Theory and practice in transportation systems to include airfield and highway design, traffic analyses, horizontal and vertical roadway alignment, pavement evaluation and maintenance, strengthening techniques, and repair.

Civ Engr 491. Introduction to Geotechnical Design Applications. Selected topics in site investigation, lateral earth pressures, cantilever retaining walls, mechanically stabilized earth walls, bearing capacity, settlement, shallow and deep foundations and the stability and analysis of earth slopes.

Civ Engr 495. Special Topics. Selected topics in civil engineering.

Civ Engr 499. Independent Study. Individual study and research in an advanced civil engineering topic approved by the department head.

Computer Engineering Major

Computer systems are an integral part of every aspect of Air Force operations. These systems range from embedded devices that perform a specific function in a weapon system to massively-parallel supercomputers used to simulate an air campaign. Because today's computing systems are so sophisticated a new field of engineering, computer engineering, has evolved. Computer engineers take a true 'systems' view toward computing design, combining the algorithm-design skills of a computer scientist with the hardware-design talents of an electrical engineer. Computer Engineering majors at USAFA acquire these skills through an interdisciplinary approach that intermingles courses from Computer Science with offerings from Electrical Engineering. This course mix provides the broad, varied background an engineer needs to succeed in this dynamic field.



Cadets who successfully complete the Computer Engineering major are awarded a Bachelor of Science in Computer Engineering degree. The departments of Electrical Engineering and Computer Science are currently taking the necessary steps to have USAFA's Computer Engineering degree accredited by the Accreditation Board for Engineering and Technology (ABET). Upon completion of accreditation, anyone who has earned a Computer Engineering degree at USAFA will have an ABET-accredited degree.

Computer Engineering Program Operational Goals

Two to three years after graduation, the Department of Electrical Engineering and the Department of Computer Science expect their Computer Engineering graduates to be officers who:

- Possess breadth of integrated, fundamental knowledge in the basic sciences, engineering, humanities, and social sciences; and depth of knowledge in Computer Engineering.
- 2. Can communicate effectively.
- 3. Can work effectively with others.
- 4. Are independent thinkers and learners.
- Can apply their knowledge and skills to solve Air Force engineering problems, both well- and ill-defined.
- Know and practice their ethical and professional responsibilities as embodied in the United States Air Force core values.

Computer Engineering Program Curricular Outcomes

Each Computer Engineering graduate shall demonstrate satisfactory:

- 1. Application of the fundamental concepts of computer engineering to solve engineering problems.
- Laboratory techniques including procedures, recording, and analysis.
- 3. Design, fabrication, and test techniques.
- 4. Use of contemporary computer engineering analysis, design, and test tools.
- 5. Written and oral communication skills.
- 6. Knowledge of ethical and professional responsibilities.
- 7. Breadth and depth of knowledge and skills in computer engineering, computer science, electrical engineering, mathematics, and other disciplines necessary to effectively identify and solve the types of complex, multidisciplinary problems they will face as Air Force engineers.
- 8. Knowledge of the benefits and the skills needed to engage in life-long learning.
- 9. Ability to be effective multidisciplinary team members.
- 10. Skills to be an independent learner while knowing when to seek assistance.
- 11. Knowledge of the role of Air Force engineering officers in our global society.
- 12. Knowledge of contemporary social, political, military, and engineering issues.

COMPUTER ENGINEERING (Comp Engr)

Offered jointly by the Department of Computer Science and the Department of Electrical Engineering

Comp Engr 465/466. Computer Systems Analysis and Design I and II. A two-course sequence in the study of computer engineering and the life cycle of computer systems. This course covers the areas of hardware and software project management, cost and size estimation, requirements analysis, configuration management, hardware/software interface design, and testing. Cadets enrolled in the course complete a two-semester project that provides practical experience in these areas.

SUGGESTED COU	URSE SEQUENCE:	The Na
3 rd Class Year	2 nd Class Year	1 st Class Year
Beh Sci 110	Aero Engr 315	Astro 320
Comp Sci 201	Bio 215	Comp Engr 465
Comp Sci 225	Civ Engr 210	Comp Engr 466
Comp Sci 380	Comp Sci 359	Comp Engr Option
El Engr 231	Comp Sci 483	Comp Sci 467
El Engr 281	Econ 221	English 411
English 211	El Engr 321	El Engr 485
Engr 311	El Engr 322	Law 310
History 202	El Engr 332	MSS 411
Math 245	El Engr 382	Philos 310
Mgt 210	El Engr 383	Pol Sci 312
Physics 215	MSS 311	9326000000000000000000000000000000000000
Pol Sci 211	Math 340	
A 10 5	Math 356	A A

Computer Science Major

Successful completion of the Computer Science major leads to the degree of Bachelor of Science in Computer Science and prepares cadets to be leaders in an Air Force that relies heavily on information technology in all mission areas. The Computer Science program is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology.

The goals of the Computer Science program are to produce officers who:

- * apply a broad and deep understanding of the field of computer science,
- * can specify, design, implement, test, debug and maintain computer-based systems,
- * are fluent in at least one general-purpose programming language,
- * learn new programming languages and software development tools on their own,
- * write and speak effectively on technical subjects,
- * work well with others on system development efforts,
- * employ the highest ethical standards in their use of computer technology
- * succeed in graduate study



The Computer Science major is very challenging and correspondingly very rewarding. Most courses in the major involve computer programming, so successful majors enjoy programming and working with computers. Strong quantitative and analytical skills as well as determination and creativity are very useful for success in the major. Approximately half of the graduating Computer Science Majors enter a rated career field and half enter the Communications and Information career field.

3rd Class Year	2nd Class Year	1st Class Year
Bio 215	Astro 320	Academy Option 1
Comp Sci 210	Civ Engr 210	Academy Option 2
Comp Sci 220	Comp Sci 359	AeroEngr 315
Comp Sci 351	Comp Sci 364	Comp Sci 380
El Engr 231	Comp Sci 467	Comp Sci 405
El Engr 281	Comp Sci 483	Comp Sci 426
English 211	Econ 200	Comp Sci 453
Engr Mech 120	Law 220	Comp Sci 454
History 202	Mgt 200	Comp Sci Option 1
Math 340	Math 356	Comp Sci Option 2
Physics 215	Math Option	English 411
Soc Sci 112	Pol Sci 311	Ops Rsch 310
	Philos 310	MSS 411

COMPUTER SCIENCE (Comp Sci)
Offered by the Department of Computer Science.

Comp Sci 110. Introduction to Computing. An introduction to principles, applications, capabilities, and limitations of computer systems. Topics include computer hardware, algorithms, information representation, networks, computer security, computers and society, system and application software, and computer programming. Students will learn how to use their own computers more effectively.

Comp Sci 210. Introduction to Programming. Introduces the fundamentals of software development as a foundation for a more advanced study of computer science. Topics include programming constructs, problem-solving strategies, algorithms, data structures, recursion and object-oriented concepts. Considerable attention is devoted to developing effective software engineering practices, emphasizing design, decomposition, encapsulation, procedural abstraction, testing, debugging, and software reuse.

Comp Sci 211. Introduction to Programming for Scientists and Engineers. Introduces the fundamental techniques of software development as a foundation for solving engineering problems using computers. Topics include programming constructs, problem-solving strategies, algorithms, and data structures, with a focus on engineering applications. Considerable attention is devoted to developing effective software engineering practices, emphasizing design, decomposition, encapsulation, modularity, testing, debugging, and software reuse. Cadets will learn a programming language and development environment that is widely used within the engineering discipline.

Comp Sci 220. Data Abstraction. Continues the introduction of software development, with a particular focus on the ideas of data abstraction, object-oriented programming, and fundamental data structures. Topics include recursion, computational complexity, event-driven programming, graphical user interface design and implementation, and fundamental computing algorithms.

Comp Sci 301X. Numerical Methods. An advanced course in the use of computer-based solutions to scientific/engineering numerical problems. Includes discussion of problem solving techniques with emphasis on structured programming for these applications.

Comp Sci 310. Information Technology. This course gives cadets the computing skills necessary to solve a wide variety of problems using a computer and application software. Topics include the World Wide Web,

hardware and software selection, desktop publishing, spreadsheet analysis, information storage and retrieval, information visualization, computer security, and telecommunications.

Comp Sci 315. Web Design and Construction. This course gives cadets experience designing and building web-based applications. Topics include web page design, web development tools, browser capabilities, HTML, XML, client-side scripting, serverside scripting, and web security issues.

Comp Sci 351. Computer Organization and Architecture. Expands on basic computer logic systems from prerequisite courses by introducing and contrasting major types of computing system organizations and introducing machine and assembly language programming. Topics include performance analysis, computer arithmetic, datapath and control, pipelining, virtual memory, I/O, device drivers, and parallel processing.

Comp Sci 359. Programming Paradigms. An applied course studying four different programming paradigms. Imperative, Object-Oriented, Functional and Logic programming paradigms will be covered Programming languages and specific language constructs supporting the four paradigms are covered, but the emphasis is on how to think about programming in each paradigm. At least one programming project is assigned for each of the four paradigms.

Comp Sci 362. Computer Simulation. Introduction to computer simulation and modeling of real-world systems. Topics include system analysis and modeling; principles of computer simulation methodologies; data collection and analysis; selecting distributions; simulation programs using general purpose languages; simulation using special simulation languages; analysis of results; and selecting alternative systems. The course includes the preparation of several computer programs using general and special purpose simulation languages and a group project involving the analysis of a real world system.

Comp Sci 364. Information Storage and Retrieval. Introduction to the basic concepts of database and information storage systems. Topics include data models, database design theory, database performance, transaction processing, web-database interaction, compression, techniques for handling large volumes of data, and contemporary database issues. Hands-on projects emphasize basic database and information storage and retrieval techniques.

Comp Sci 380. Design and Analysis of Algorithms. Advanced design and analysis of algorithms used in modern computing systems. Topics include analysis of algorithms, basic structures, advanced abstract data types, recursion, computability and complexity. Problem solving and analytical skills are improved by examining the application of abstract data types to several problem domains with an emphasis on the impact of design decisions on algorithm performance. Concepts are reinforced by several programming exercises.

Comp Sci 405. First-Class Seminar. A course designed to give Computer Science majors the opportunity to discuss topics that cadets may encounter in the Air Force upon graduation, including computer ethics. Leaders from around the Air Force are invited to speak in the classroom, offering their views of what it takes to be successful in the Air Force and the impact of technology in our career field. Open only to Computer Science majors.

Comp Sci 426. Languages and Machines. Students will learn the theoretical foundations of computer science and apply these concepts to appropriate stages in compiler implementation. Topics include finite automata, formal language theory, grammars, scanners, parsing techniques, code generation, symbol tables, and run-time storage allocation. Students will design and implement a syntax-directed compiler for a high-order programming language.

Comp Sci 438. Computer Security and Information Warfare. An introduction to the technical aspects of Information Warfare. Emphasis is on how computer systems and networks are secured in order to protect them from an Information Warfare attack. Topics include viruses, worms, hacking, phreaking, authentication, access and flow controls, security models, encryption, intrusion detection, and firewalls.

Comp Sci 453. Software Engineering I. First course of a two semester capstone sequence for Computer Science majors. Students learn about issues related to developing large software systems. Topics include software development process lifecycles, software project management, configuration management, quality assurance management, requirements elicitation, system analysis, specification, software architecture, high-level design, and testing. Students begin work on a two-semester software development project for a real customer.

Comp Sci 454. Software Engineering II. Second course in the two-semester capstone sequence for Computer Science majors. Students learn about issues related to developing large software systems. Topics include detailed design, implementation, maintenance, and contemporary software engineering issues. Students complete work on a two-semester software development project for a real customer.

Comp Sci 467. Computer Networks. Examination of long-haul and local area computer network, and related security issues. Topics include OSI reference model, data transmission, circuit switching, packet switching, satellite networks, local area networks, network protocols, firewalls, cryptography, intrusion detection and information warfare.

Comp Sci 471. Artificial Intelligence. Introduction to major subjects and research areas in artificial intelligence (AI). Topics include: problem solving techniques, knowledge representation, machine learning, heuristic programming, AI languages, expert systems, natural language understanding, computer vision, pattern recognition, robotics, and societal impacts. Course will also explore current and projected uses of AI in the Air Force.

Comp Sci 474. Computer Graphics. Basic concepts of interactive computer graphics including both vector and raster graphics. Topics include mathematics of 2-Dimensional and 3-Dimensional geometric transformations, interactive techniques, graphics hardware architectures, graphic algorithms, and realism in computer-generated images. Course includes several computer projects.

Comp Sci 483. Operating Systems. Examines the design and implementation of programs that manage hardware resources and provide abstract interfaces for hardware control. Topics include resource allocation, synchronization primitives, virtual memory, information protection, performance measurement, I/O sub-subsystems, and distributed computing.

Comp Sci 495. Special Topics. Selected topics in computer science.

Comp Sci 496. Computer Science Seminar. Advanced topics in computer science. Students participate in and lead discussions on significant issues in current computer science research as well as key historical developments.

Comp Sci 499. Independent Study. Individual study and research supervised by a faculty member. Topic established with the department head.

Economics Major





Economics is the scientific study of how people and institutions use their limited resources to satisfy their unlimited wants. The Economics Major appeals most to the student who likes to develop analytical skills which can be used to make effective decisions in countless areas. Deciding how to allocate military personnel between career fields, choosing production goals for your company, and evaluating automobile safety and emissions regulations are done using skills developed in the Economics Major. Many problems you will face

during your Air Force career have no specific solution—it will be up to you to use the available information to approach and solve them. Economics teaches you to make the best of the information you have and is therefore widely recognized as a solid background for many career fields.

The Economics Major also prepares students well for a variety of graduate school programs. One of the more popular graduate programs, the Master's in Business Administration (MBA), requires candidates to take course work including economic and finance theory, mathematics, and statistics. As an economics major, you would be intimately familiar with these relatively difficult subjects before beginning graduate study. In addition, many law schools and public policy institutes (such as the Kennedy School of Government

at Harvard) recommend or require a strong economics background for applicants. This background helps students develop a logical, ordered approach to problem solving vital to those areas of study. Since the problem-solving and decision making techniques you learn as an economics major apply to other disciplines, you may elect to double major in economics and another discipline. Our most common double majors are economics/operations research, and economics/political science.

3rd Class Year	2nd Class Year	1st Class Year
Econ 200	Bio 215	Academy Option 1
Econ 221	Civ Engr 210	Academy Option 2
English 211	Econ 222	Aero Engr 315
Engr Mech 120	Econ 333	Astro 410
For Lang 3	Econ 340	Econ 465
For Lang 4	Econ 356	Econ 478
History 101	Elec Engr 215	Econ Option 1
History 202	English 411	Econ Option 2
Law 220	Math 356	Econ Option 3
Mgt 200	Ops Rsch 310	Econ Option 4
Physics 110	Philos 310	Mgt 341
Physics 215	Pol Sci 211	MSS 400
Soc Sci 112		

Following is a list that shows what past and present members of our economics faculty have done in their careers. Note that some areas require graduate degrees in economics, but most do not.

Squadron Commander Assistant Deputy Commander for Operations **Procuring Contracting Officer** Computer Systems Analyst Intelligence Officer Foreign Military Sales Negotiator Air Force Plant Representative at Boeing Management Analysis and Budget Officer Hospital Administrator Air Attaché Air Staff Officer Accounting and Finance Officer NATO Force Planner Labor Economist (Pentagon) Advisor to the National Security Council Advisor to the Joint Chiefs of Staff

ECONOMICS (Econ)

Offered by the Department of Economics and Geography.

Econ 200. Introduction to Economics. Introduces the economic way of thinking, emphasizing its critical importance in analyzing contemporary issues. Topics will include scarcity, price theory, markets, decision-making, environmental issues, the role of the government and the global economy. Includes a basic economic explanation behind the influence of political, social, legal, regulatory and technical issues. Incorporates experiments to examine human behavior and provide insight into real-world concerns.

Econ 221. Principles of Microeconomics. Foundations of key microeconomic principles. Indepth analysis of the creation and distribution of goods and services through the supply and demand model and the function of price in a market economy. Includes an in-depth study of production, costs, and efficiency in the allocation of limited resources. Explains the limitation of markets and evaluates the consequent role of government in the economy in relation to real-world events.

Econ 222. Principles of Macroeconomics. Foundations of key macroeconomic principles. Analysis of the macroeconomics of a nation at an aggregate level. Analytical models are developed and used to analyze the impacts of alternative government economic policies. Topics include inflation, unemployment, national income, the banking system, fiscal and monetary policy, debt, deficits, and international finance and trade (including exchange rates and barriers to trade). Focuses on domestic and global economic environments of organizations and discusses current and historical issues in the macroeconomy relating to real-world events. Discusses the impact of macroeconomic policies on the defense sectors.

Econ 323. Managerial Economics. Traditional economic theory emphasizing the principles of product and factor pricing, allocation and employment of resources, and the implications of various market structures. In addition to these microeconomic topics, the use of other economic tools which may aid the decision maker will be discussed. This course is designed for cadets who are not majoring in economics and offers material similar to that of a managerial economics course taught in a business program.

Econ 333. Price Theory. Traditional microeconomic theory emphasizing the principles of product and factor pricing, allocation and employment of resources, and the implications of various market structures using calculus and game theoretic analysis. Investigates the usefulness of price theory in decision making

Econ 340. Development of Economic Thought. Modern economic theory developed in response to a variety of economic forces beginning with the Industrial Revolution through the Great Depression and into today's globalization of the world's economy. This course links these forces with great economic thinkers of the past such as Adam Smith, Karl Marx, Alfred Marshall, and John Maynard Keynes. Upon completion of this course, you will have gained an appreciation of how today's economic theories have been influenced by the economic conditions that their originators experienced.

Econ 347. Quantitative Economic Methods. Analysis of economic problems through mathematical methods and the use of quantitative models

Econ 351. Comparative Economic Systems. An examination of the world's major economic systems including capitalism, market socialism, and planned socialism. Course will include both a theoretical approach and a case study analysis of contemporary economic systems. Among the countries evaluated will be US, Eastern Europe, France, West Germany, Yugoslavia, China, and Japan.

Econ 356. Macroeconomic Theory. Analysis of national income, employment, price level determination, monetary, and fiscal policies. Contemporary macroeconomic issues are explored through the Economic Report of the President.

Econ 374. Survey of International Economic Issues. Examination of current issues in the commercial relations among nations, including international trade, international finance, economic development, and the multinational enterprise.

Econ 377. Financial Markets. An introduction to and analysis of how the financial markets allocate personal and corporate resources in a modern capitalistic economy. Specific emphasis is placed on the characteristics, valuations, and functions of

the various financial instruments traded in the financial markets. Also covered in some depth are the operational mechanisms of the financial markets, the relationship of government fiscal and monetary policies to finance market activity, the individual and corporate investment decision, and the understanding of financial press information.

Econ 391. Industrial Organization. This course focuses on the structure and performance of markets and their regulation. It investigates the observed behavior of firms engaging in both legal and illegal marketplace competition. The course also examines the evolution of antitrust law in the United States and the impact these laws have on the market. Topics covered in the course include predatory pricing, price discrimination, bundling and tie-ins, tacit collusion, mergers, and acquisitions.

Econ 411. Introduction to Game Theory. This course introduces the concepts required to analyze strategic situations, or situations in which a player's payoff depends on his choices and those of the other players. Topics include zero-sum and nonzero-sum games, normal and extensive form games, the implications of informational asymmetries on these strategic situations, auctions, and bargaining models. Developing the ability to think strategically is valuable to everyone, but this course is especially important for those studying any of the social sciences.

Econ 422. Labor Economics. This course examines how people make decisions regarding their participation in the labor market. Included in this course is the examination of government policies (such as social security, minimum wage, etc.) and their impacts of the supply and demand of labor. Wage determination for women and minorities will be discussed in light of the supply and demand forces in the influence of the human capital decisions made by individuals.

Econ 450. International Economics. Economic aspects of international relations, international trade, relationships among national currencies, international monetary systems, the balance of payments, and commercial policy.

Econ 452. Economies of Transition. An analysis of the economic changes taking place in Russia, and other parts of the former Soviet Union, and Eastern Europe. The course focuses on price liberalization, privatization, stabilization efforts and other measures necessary for a transition from a centrally planned economy to a market economy.

Econ 455. Economics of Development. This course studies the problem of sustaining accelerated economic growth in less-developed countries. Topics include economic growth, poverty, and inequality as well as the relevance of economic theory. Case studies from Latin America, East and Southeast Asia, Africa, and Eastern Europe are analyzed.

Econ 457. Economies of Asia. This course analyzes the economic structure of China beginning with the 1949 revolution, progressing through central planning, and culminating in its current state; a hybrid of planning and market flexibility within a communist controlled nation. The course will also examine the Asian "economic miracle" with South Korea, Japan, Singapore, and Hong Kong among the countries evaluated.

Econ 466. Forecasting and Model Building. Continues development of econometric techniques, with emphasis on time series forecasting procedures and on methods to make optimal use of sparse or deficient data in statistical model estimation. This course is recommended for those cadets planning to pursue graduate study.

Econ 473. Public Finance. Economics of the government sector, with emphasis on public goods, taxation, fiscal policy, and government regulation.

Econ 475. Money, Banking and Financial Institutions. Advanced treatment of money and its role in the economy. Critical analysis of financial structure and institutions, the Federal Reserve System and the increasing importance of the global financial arena. Special emphasis is placed on financial events and policy issues.

Econ 478. Seminar in Defense Economics. This course applies macroeconomics and microeconomics theory to analyze a variety of defense policy issues. Examples of topics typically covered include: defense alliances, military personnel system and pay, the defense industrial base and acquisition.

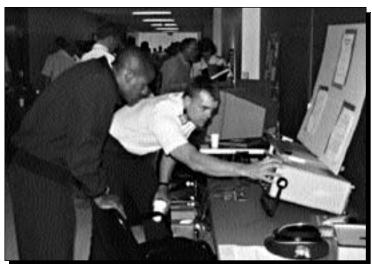
Econ 495. Special Topics. Selected topics in economics of either an advanced treatment or general interest orientation.

Econ 499. *Independent Study*. Tutorial investigation of a specific area of economics.

Electrical Engineering Major

Electrical engineers (EEs) have been instrumental in creating today's technology. Without the efforts of EEs, modern computers, control systems, or even high-fidelity sound systems would not be possible. The modern military would not have its current capabilities without electronics and electrical engineers. For instance, sophisticated sensors detect and locate targets; "smart" computer guided munitions attack targets with amazing accuracy; aircraft fly "by wire" and "by light"; and aircrews depend on terrain following

radar. All of these systems are critical to the current success and future of the Air Force. The Electrical Engineering Major covers the basic principles behind these systems and provides graduates with valuable insight into their operation. Electrical engineering is also an excellent background for medical school, law school, and many other advanced degrees. If you hope to fly in the Air Force, a good background in advanced electronics systems will help you understand and use tomorrow's weapon systems. If you want to help the Air Force find new and better ways to accomplish the Air Force mission, this major may be for you! More information about electrical engineering is at: usafa.af.mil/dfee.



3rd Class Year	2nd Class Year	1st Class Year
AeroEngr 315	Beh Sci 110	Astro 320
Bio 215	El Engr 321	El Engr 434
Civ Engr 210	El Engr 322	El Engr 447
Econ 221	El Engr 332	El Engr 463
El Engr 231	El Engr 333	El Engr 464
El Engr 281	El Engr 382	El Engr Option 1
English 211	El Engr 443	El Engr Option 2
Engr 311	Law 310	English 411
History 202	MSS 311	Engr/Bas Sci Option
Math 243	Math 346	MSS 411
Math 245	Math 356	Philos 310
Mgt 210	Pol Sci 312	
Physics 215		
Pol Sci 211		

Operational Goals

Two to three years after graduation, the Department of Electrical Engineering expects its electrical engineering graduates to be officers who:

- 1. Possess breadth of integrated, fundamental knowledge in the basic sciences, engineering, humanities, and social sciences; and depth of knowledge in Electrical Engineering.
- 2. Can communicate effectively.
- 3. Can work effectively with others.
- 4. Are independent thinkers and learners.
- 5. Can apply their knowledge and skills to solve Air Force engineering problems, both well- and ill-defined.
- Know and practice their ethical and professional responsibilities as embodied in the United States Air Force core values.

Curricular Outcomes

Each Electrical Engineering graduate shall demonstrate satisfactory:

- 1. Application of the fundamental concepts of electrical engineering to solve engineering problems.
- 2. Laboratory techniques including procedures, recording, and analysis.
- 3. Design, fabrication, and test techniques.
- 4. Use of contemporary electrical engineering analysis, design, and test tools.
- 5. Written and oral communication skills.
- 6. Knowledge of ethical and professional responsibilities.
- 7. Breadth and depth of knowledge and skills in electrical engineering, computer science, mathematics, and other disciplines necessary to effectively identify and solve the types of complex, multidisciplinary problems they will face as Air Force engineers.
- 8. Knowledge of the benefits and the skills needed to engage in life-long learning.
- 9. Ability to be effective multidisciplinary team members.
- 10. Skills to be an independent learner while knowing when to seek assistance.
- 11. Knowledge of the role of Air Force engineering officers in our global society.
- 12. Knowledge of contemporary social, political, military, and engineering issues.

The major has four different suggested areas of study: electronics, communications, computer systems, and controls. If you prefer not to concentrate in these areas, you may take any two electrical engineering options.

Electronics - This area of study provides a general foundation in all areas of electrical engineering. The emphasis is on electronic design, components, and applications. It is well suited to those who want to retain the flexibility to work and/or do graduate studies in EE, physics, medicine, or other technical fields.

Communications - This area provides the basis for understanding modern communication and radar systems, including fiber optics, modulation techniques, radio subsystems, and antennas. Study in this area leads to a better understanding of satellite communications, telecommunication systems, digital signal processing, stealth technology, and advanced radar systems.

Computer Systems - In this area of study, the fundamentals and advanced concepts of computer design are explored. Topics include microcontrollers, embedded system design and interfacing, and computer architecture. Classes in this area of study lead to a better understanding of modern computer systems and digital hardware design.

Controls - This area consists of up to four courses emphasizing the analysis and design of automatic control systems which are integral components of modern society, from a simple thermostat to space vehicles.

Universal Area - You are free to choose two electrical engineering elective courses to fulfill the major's requirements, along with the engineering/basic science option, based on your interest.

ELECTRICAL ENGINEERING (El Engr)

Offered by the Department of Electrical Engineering.

El Engr 215. Electrical Signals and Systems. An introduction to signal analysis and electronic system design. Topics include signal representation, signal

analysis in the time and frequency domains, basic circuit analysis, and realization of electronic functions used in the design and operation of Air Force instrumentation, communication, and digital signal processing systems.

El Engr 231. Electrical Circuits and Systems I. An introduction to circuit analysis and system design.

Topics include: circuit models of electrical devices and systems; nodal and mesh analysis; Thévenin and Norton equivalent circuits; operational amplifier circuits; transient response of first-order circuits; sinusoidal steady-state response; Analog-to-Digital and Digital-to-Analog converters; and communication systems.

El Engr 281. Introductory Digital Systems. An introduction to the fundamental principles of logic design. Includes Boolean algebra, combinational and sequential logic networks with basic design and analysis techniques, and an introduction to digital processing systems. Laboratory projects include the analysis and design of digital computer architecture.

El Engr 321. Electronics I. An introduction to semiconductor electronics. Covers qualitative and quantitative analysis of semiconductor devices with emphasis on the diode and transistor. Includes modeling, analysis and design of basic electronic circuits employing these devices.

El Engr 322. Electronics II. A continuation of El Engr 321. Extends basic electronic circuits in applications employing multiple active devices including differential/operational amplifiers, combinational and sequential digital integrated logic circuits.

El Engr 332. Electrical Circuits and Systems II. A continuation of circuit analysis and system design. Topics include transient response of second order circuits, mutual inductance, Laplace transform techniques in circuit analysis, analog filter design, and two-port networks.

El Engr 333. Continuous-Time Signals and Linear Systems. An introduction to analog signal processing by linear, time-invariant systems. Topics include signal characterization, convolution, Fourier analysis methods, and state variable techniques.

El Engr 360. Instrumentation Systems. Principles and design of modern data acquisition and instrumentation systems for non-electrical engineering majors. Includes measurement techniques, transducers, analog and digital data processing systems and displays.

El Engr 382. Microcontrollers. Provides a broadbase understanding of microcontroller systems. The microcontroller principles presented provide a foundation that can be used in other courses to simplify (in some cases, substantially) projects. Includes design, application, interfacing, assembly language, and microcontroller hardware.

El Engr 383. Microcomputer System Design I. A course in the design of digital systems using microprocessors. Topics include structured system design, microprocessor instruction sets, support

software, and system timing. Also covered are input/output, peripherals, and hardware-software interfacing techniques.

El Engr 387. Introduction to Robotic Systems. Provides fundamental knowledge on robotic systems. The course topics include kinematics, dynamics, motion control, controller design, and trajectory planning of robot manipulators. Cadets will also be introduced to basic computer vision techniques.

El Engr 434. Discrete-Time Signals and Systems. An introduction to digital signal processing. Topics include classical solutions to linear difference equations, the z-transform, digital filter design, quantization effects of Analog-to-Digital and Digital-to-Analog converters, frequency analysis of decimation and interpolation, discrete Fourier transform, and the fast Fourier transform.

El Engr 443. Electromagnetics. The study of Maxwell's Equations, plane waves, transmission, and radiating systems. Topics include wave propagation, transmission lines, waveguides, and antennas.

El Engr 444. Applied Field Theory. Topics include antennas, fiber optics, scattering, Fourier optics, radiowave propagation, radar cross-section, and numerical methods. The analysis and design of practical systems are emphasized. A few lessons are reserved for current state-of-the-art topics, such as stealth technology, adaptive antennas, and holography.

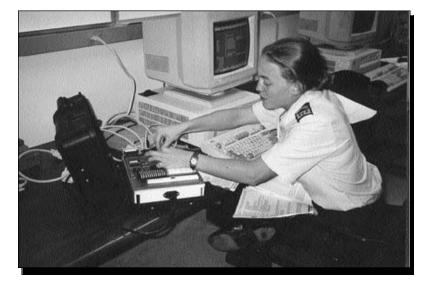
El Engr 447. Communications Systems I. An introduction to modern electrical communications. The performance of various modulation and detection methods for both analog and digital systems are analyzed. Coverage includes theory of operation, effects of random noise, bandwidth and other communication design constraints.

El Engr 448. Communications Systems II. A follow-on course to El Engr 447 covering random processes and spectral analysis, optimal receivers, and performance of communication systems corrupted by noise. Advanced topics that vary from semester to semester include satellite communications, image processing, data communications, fiber optics, and wireless communications.

El Engr 463. Design Project Techniques. Presents contemporary methods essential to planning and execution of complex electronic projects. Includes instruction in contemporary management tools and circuit fabrication methods. Extensive preparation for the spring semester design experience, El Engr 464.

El Engr 464. Design Project. This capstone laboratory course integrates advanced concepts in





electronics, instrumentation, signal processing, communications, control theory, and microcomputer hardware with production and management methods developed in Engr 410. The course uses a design project to emphasize Air Force applications and requires cadets to design, build, and test the project, and present a report on their work.

El Engr 472. Instrumentation System Fundamentals. Introduction to instrumentation components. Analysis and design of advanced operational amplifier circuits, including Schmitt-trigger, waveform generators, instrumentation amplifiers, and active filters. Discussion and practical design of transducer circuits to instrument various processes.

El Engr 473. Introduction to CMOS VLSI Circuit Design. Introduction to design of Very Large Scale Integrated (VLSI) circuits in silicon Complementary Metal Oxide Semiconductor (CMOS) technology. Course includes discussion of CMOS fabrication technology, combinational and sequential logic structures, analog circuit structures, computer aided layout and simulation techniques, load/timing analysis and integrated systems design techniques/considerations.

El Engr 484. Microcomputer System Design II. This course is the culmination of the Computer Systems design sequence using microprocessors. Students investigate advanced peripheral interfacing techniques, advanced memory systems, advanced bus features, co-processors, serial communications, cross-compilers, and Digital-to-Analog conversion. This is accomplished through a series of laboratory design exercises.

El Engr 485. Computer Architecture. This final course in the Computer Systems area of study quantitatively examines trade-offs in the design of high-performance computer systems. Topics include price/performance, instruction sets, hardwired control versus microprogramming, memory hierarchy, cache memory, virtual memory, pipelining, Reduced Instruction Set Computers (RISC), input/output, and parallel processing. Final project will examine state-of-the-art processors and computers.

El Engr 495. Special Topics. Selected topics in electrical engineering.

El Engr 499. Independent Study. Individual study and research in an engineering design topic.

Engineering Mechanics Major

Engineering mechanics is considered the foundation engineering discipline with roots tracing back to the likes of Archimedes, Leonardo da Vinci, Galileo, and Sir Isaac Newton. Engineering mechanics deals with forces acting on bodies (such as satellites, missiles, and aircraft) and how bodies dynamically respond to those forces. Nearly all more specialized engineering disciplines begin with one or more courses in engineering mechanics. The USAFA Engineering Mechanics degree is accredited by the Accreditation Board for Engineering and Technology (ABET).



If you want to design and build things, then you should consider majoring in engineering mechanics. If understanding, building, and using state-of-the-art materials such as composites and ceramics intrigues you, this challenging major may be right for you. If you aren't sure what engineering discipline to pursue right now and you want to keep your options open, this broad-based foundational major may be perfect for you.

The Goal of the Department of Engineering Mechanics is to Educate Engineers for the Military Profession. The Engineering Mechanics program is specifically designed with the goal of generating Air Force officers who:

- Possess breadth of integrated, fundamental knowledge in engineering, the basic sciences, social sciences, and humanities; and depth of knowledge in Engineering Mechanics.
- 2. Communicate effectively.
- 3. Work effectively on teams and grow into team leaders.
- 4. Are independent learners, and as applicable, are successful in graduate school.
- Can apply their knowledge and skills to solve Air Force engineering problems, both well- and illdefined.
- Know and practice their ethical, professional, and community responsibilities as embodied in the United States Air Force core values.

The Program Operational Goals above describe what the Air Force would like to see in our graduates as they begin their careers as Air Force Engineering Officers. To best support these goals our program's curriculum is designed such that, by graduation, our graduates possess certain qualities or outcomes. These Program Curricular Outcomes, call for our graduating cadets to satisfactorily demonstrate:

- 1. Application of the fundamental analysis concepts of engineering mechanics to solve engineering problems.
- Modeling, design, and fabrication techniques of systems with solid and fluid components under realworld conditions.
- 3. Use of contemporary engineering mechanics analysis, design, and test tools.
- Experimental techniques to include test design, execution, data analysis and interpretation.
- 5. Written and oral communications skills.
- 6. Knowledge of ethical and professional responsibilities.
- Breadth and depth of engineering knowledge and skills to effectively identify and solve the types of complex, interdisciplinary problems they will encounter as Air Force engineers.
- 8. Ability to be effective interdisciplinary team members and leaders.
- 9. Skills to be independent life-long learners while knowing when to seek help.
- Knowledge of contemporary social, political, military, and engineering issues, as well as the role of Air Force engineering officers and citizens in our global society.



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3 rd Class Year	2 nd Class Year	1 st Class Year
Bio 215	Aero Engr 315	Academy Option 1
Beh Sci 110	Econ 200/Mgt 200	Academy Option 2
Civ Engr 210	Beh Sci 200	Astro 320
El Engr 231	Engr Mech 320	English 411
English 211	Engr Mech 332	Engr Option 1
Engr Mech 330	Engr Mech 340	Engr Option 2
History 202	Engr Mech 350	Engr Mech Option 1
Math 243	Law 220	Engr Mech Option 2
Math 245	Math 346	Engr Mech 405
Mech Engr 290	Math 356	Engr Mech 460
Physics 215	Mech Engr 312	Mech Engr 492
Soc Sci 112	Mech Engr 341	MSS 400
	Pol Sci 211	Philos 310

With a degree in engineering mechanics you can get an Air Force assignment as an aeronautical engineer, civil engineer, astronautical engineer, mechanical engineer, or project engineer. The engineering mechanics degree also satisfies the educational requirements for Air Force Test Pilot, Flight Test Navigator, and Flight Test Engineer duties. Additional specialties are Scientific Analyst and Acquisition Project Officer.

If you are a top performer in the Engineering Mechanics Major, graduate school can be an option as a first Air Force assignment, either by winning a prestigious national scholarship (Guggenheim, Hertz, Rhodes, etc.) or through direct departmental sponsorship. The Engineering Mechanics Major gives you the flexibility to pursue either a more specialized degree in graduate school or to continue your broad-based study in engineering mechanics. Whether you ultimately choose aeronautical engineering, mechanical engineering, astronautical engineering, materials engineering, or engineering mechanics, your decision will be an informed one.

For more information on the engineering mechanics curriculum please look up our home page at <u>usafa.af.mil/dfem</u>.

ENGINEERING MECHANICS (Engr Mech)

Offered by the Department of Engineering Mechanics.

Engr Mech 120. Fundamentals of Mechanics. An introduction to the fundamental principles of statics and mechanics of materials applied to aerospace systems. Topics include: force and moment equilibrium in three dimensions using free body diagrams and vector algebra; stress, strain, and deformation response of deformable bodies to axial, torsional, flexural, and combined loadings; material properties and selection criteria; and failure modes of materials and structures.

Engr Mech 320. Dynamics. This course covers the analysis of kinematics and kinetic motions of particles and rigid bodies. Topics include kinematics with absolute and relative motions in Cartesian, path, and polar coordinates; and kinetics using forcemass-acceleration, work-energy, and impulse momentum methods. Methods emphasize vector solutions.

Engr Mech 330. Static Analysis of Structures. Beam theory and analysis to include internal shear and moment diagrams, stress at a point, beam deflections and introduction to statically indeterminate members. Transformation of stress and strain at a point, Mohr's circle for plane stress, principal stresses and introduction to failure theories. Introduction to classical lamination theory for fiber-reinforced composites. Euler buckling. Stress Concentrations. Introduction to energy methods and Castigliano's 2nd Theorem for deflections in two-dimensional transfer.

Engr Mech 332. Aerospace Structures. Analysis and design of lightweight, thin-walled and semimonocoque structures. Margin of safety. Material selection including strength, stiffness, and weight considerations.

Engr Mech 340. Materials Science for Engineers. Survey of engineering applications of non-ferrous and ferrous alloys, polymers, ceramics and composites. Basic crystallographic notation and molecular structure of common engineering materials. Principles of metallurgical thermodynamics and kinetics applied to phase transformations and strengthening mechanisms.

Engr Mech 350. Mechanical Behavior of Materials. Behavior of materials under simple axial, biaxial and triaxial states of stress. Micromechanisms of elastic and inelastic deformation and strengthening mechanisms. Introduction to linear elastic fracture mechanics. Fatigue failure theories and fatigue crack growth analysis. Applications to design of aerospace vehicles and structures.

Engr Mech 405. Engineering Seminar. A seminar course designed to help Department of Engineering Mechanic's majors

transition from their undergraduate education to duties as an Air Force engineering officer and engineering professional. Seminar topics include current literature, engineering ethics and typical engineering problems that cadets may encounter after graduation. Invited speakers will offer their view of what it takes to be successful in the Air Force.

Engr Mech 421. Vibrations. Free and forced vibrations of discrete systems. Effect of viscous and other types of damping considered. Matrix methods used to analyze multi-degree-of-freedom systems. Dynamic analysis of continuous systems.

Engr Mech 43l. Introduction to Finite Element Analysis. Analysis and design of truss, frame and semimonocoque structures using the direct stiffness and energy formulation of the finite element method. Theoretical development of elementary finite elements. Computer-aided design and analysis projects using commercial, professional software.

Engr Mech 432. Finite Element Analysis. Analysis and design of complex structural components using the finite element method. Theoretical development of two-dimensional finite elements for static, vibration, and heat transfer analyses. Special topics in solving Laplace's equation. Computer-aided design and analysis projects using commercial finite element software.

Engr Mech 440. Physical Metallurgy. Physical metallurgy related to properties of engineering metals. Crystal structure and imperfections, diffusion, thermodynamics, phases and phase transformations, and thermomechanical processing. Discussion of specific metals/alloy systems. Thermomechanical strengthening design project and semester-long knife design project.

Engr Mech 450. Aerospace Composite Materials. Introduction to select advanced aerospace materials. Topics covered include: mechanical behavior, design and analysis, processing, testing, inspection and repair of resin-matrix composite materials. Topics emphasized through hands-on project in design, fabrication, and testing of a composite structure.

Engr Mech 460. Experimental Mechanics. Introduction to experimental measurements and their role in the mechanical design process. Includes theory and application of static and dynamic instrumentation to include: strain, vibration, temperature and pressure. Hands-on laboratory experience constitutes one-half of the course. Laboratory sessions involve analysis, design, test plans, calibration and testing.

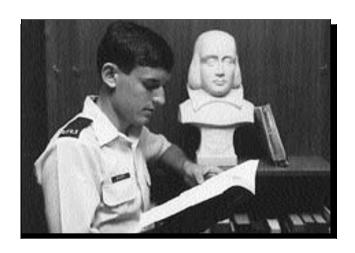
Engr Mech 495. Special Topics. Selected topics in mechanics.

Engr Mech 499. Independent Study. Individual study, research or design on an engineering topic.

English Major

Your work at the Academy prepares you to serve our nation as an exceptional leader, and superb leadership starts with effective, engaging communication. That's exactly what you'll learn as an English major. Foundational to great leadership is a study of what it means to be human. You'll explore human nature when you read and write about the best literature written, and you'll gain an understanding of how to manage conflict. As an English major, you will be qualified for every Air Force career field except the developmental engineering field.

When you leave the Academy with an English degree, you'll be one of the most valuable junior officers in your wing. You will be one of those to whom the commander will turn when he or she needs a confident, articulate public speaker, or when your unit needs a precise, persuasively written plan for action. Your public speaking and writing skills will make you indispensable!



e rd Class Year	2 nd Class Year	1 st Class Year
Beh Sci 110	Aero Engr 315	Academy Option 1
Bio 215	Econ 200/Mgt 200	Academy Option 2
Civ Engr 210	English Option 1	Astro 410
English 211	English 353	English 471
English 341	English 370/411	English 472
Engr Mech 120	English 461	English 490
For Lang 221	English 462	English Option 2
For Lang 222	El Engr 215	English Option 3
History 202	Geog 340/Ops Rsch 310	English Option 4
Physics 110	Law 220	MSS 411
Physics 215	Math 300	Pol Sci 311
Sco Sci 112	Open Option	
	Philos 310	

ENGLISH (English)

Offered by the Department of English.

English 109. Academic Communication for English as a Second Language Students. Introduction to academic reading and writing for English as a Second Language (ESL) students. Frequent writing assignments that emphasize writing for the various academic communities. Emphasis on the rhetorical, syntactical, and grammatical conventions of written English.

English 110. Basic Academic Writing. Students will gain a heightened understanding of the crucial role language plays in every aspect of our lives, becoming aware of the power of rhetorical strategies in a variety of arenas. They will carry this broader knowledge to English 111, where they will learn how to tailor specific rhetorical strategies to their own writing. Additionally, students will develop their knowledge of the syntactic and grammatical conventions of written English.

English 111. Introductory Composition and Research. Emphasizes the fundamental uses of language, concentrating on sound academic writing and the rhetoric of argument. Focuses on the persuasive nature of all academic writing and establishes a foundation of research and documentation skills through frequent writing assignments requiring that a cadet's own words be enriched and strengthened by the words and ideas of others.

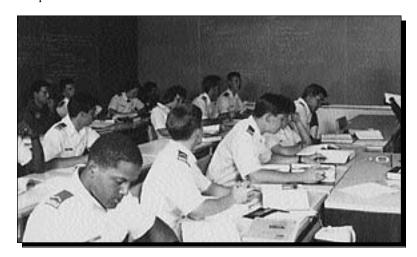
English 211. Intermediate Composition and Literature. Builds on English 111. Refines analytical and critical reading skills introduced in English 111 through the rhetorical examination of significant literary texts written by some of the world's great writers. Concentrates on masterpieces and contemporary works that reflect our culture and values, particularly those that focus on moral and ethical issues and examine relevant concerns such as leadership, heroism, integrity, and the individual and social responsibility.

English 330. Communication in the Information Age. Examines the writing and presentation skills essential for Air Force leaders in the information age. Considers how computers and hypertext affect communication and how today's leaders use and present technical information to accomplish the mission. Through labs, discussions, and workshops, students develop the necessary skills to communicate effectively in cyberspace (via the Web and e-mail).

English 341. Literary Criticism. Introduces the theory and practice of literary criticism. Concentrates on major critical approaches, applying them to representative literature and showing how they lead the reader to deeper understanding and satisfaction from the work of art.

English 353. Shakespeare. Intensive study of Shakespeare's poetry and major plays within the cultural and historical perspectives of Renaissance England.

English 360. Classical Masterpieces. A study of influential genres of the Classical tradition, including epic, drama, and history. Authors have included Homer, Sophocles, Aristophanes, Thucydides, Virgil, Tacitus, and Dante. Key concepts to be studied include the role of the hero, the nature of political institutions, and the relationship between man and the divine—in short, the foundations in Greek, Roman and Medieval European culture.



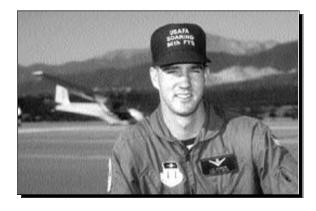
English 365. Television News/Production: Production and Performance. Examines and uses the fundamentals of television production including: directing, writing, and operating the various pieces of equipment necessary for producing television programs. Students write, direct, produce, and perform in the weekly "Blue Tube" program broadcast via closed-circuit television to the Academy community. Lab work stresses understanding the basic television production fundamentals and how to use the electronic technology to communicate to a mass audience.

English 367. The Literature of American Minorities. A study of literature written by and about minorities that have had or continue to have an influence on American culture. Emphasis changes for each offering, but may focus on women, the literature of Black Americans, Hispanics, Native Americans, or Asian-Americans. Kate Chopin, Toni Morrison, Richard Wright, Rudolfo Gonzales, Toshio Mori, Cassan Cameron, N. Scott Momaday, and Frank Chin are representative writers whose works might be included in the course. Seminar approach.

English 370. Speech Communication. Considers selected topics in advanced speech communication through informative and persuasive speaking.

Frequent speaking assignments. This course replaces the core English 411 requirement for English majors.

English 383. Literature and Science. Considers the interrelationships among science, technology, and literature—non-speculative and speculative, science fact and science fiction. Eclectic in topical coverage, the course examines both the impact of science on literature and the impact of literature on science.



English 395. Practicum in Writing Instruction. A seminar course examining composition theory and applying that theory to tutorial writing instruction

English 411. Advanced Composition and Public Speaking. Builds on English 111 and English 211. By examining the rhetoric of significant texts, this course studies a variety of issues and examines how these issues have found expression in writing and speaking. Writing assignments require researching and articulating a persuasive thesis. Speaking assignments, both academic and practical, require students to explain and defend individual positions on issues of substance. This course is not required for English majors who take English 370 instead.

English 461. British Literature 1: Beginnings to Romanticism. A survey of English poetry, drama, and prose of such authors as Chaucer, Spenser, Shakespeare, Milton, Pope, Swift, Fielding, and Johnson.

English 462. British Literature II: Romanticism to the Present. A survey of later English literature focusing on Romantic poetry, Victorian prose and poetry, and the Modern novels. Works are by such authors as Byron, Shelley, Austen, Bronte, Dickens, Hardy, Conrad, Tennyson, Browning, Yeats, Lawrence, and Fowles.

English 471. American Literature 1: Beginnings to Naturalism. A survey of American fiction, poetry, drama, and prose by such authors as Jefferson, Irving, Poe, Hawthorne, Melville, Whitman, Twain, and Dickinson.

English 472. American Literature II: Naturalism to the Present. A continuation of the survey of American fiction, poetry, drama, and prose by such writers as Robinson, Eliot, Frost, O'Neill, Fitzgerald, Faulkner, Hemingway, Wright, and selected contemporary authors.

English 475. Creative Writing. Examines techniques of creative writing. In a workshop atmosphere, students experiment with writing, focusing generally on a specific form such as the short story or poetry. The student's own work becomes the focus of discussion and attention.

English 484. Literature of War. Explores the treatment of war and issues related to military conflict in literature and other arts. Typical approaches are topical (The Warrior as Hero), cultural (American War Literature), or historical (Literature of the Vietnam War).

English 485. Contemporary Literature. A study of literature written within the last twenty years. Several genres will be offered, depending upon the semester, and will change for each offering. Emphasis will be on American and British literature, plus Russian, Central American, European and Third World. Examples of contemporary writers are Sam Shepard, August Wilson, Marsha Norman, David Mamet, William Carpenter, Stephen Dobyns, Ann Beattie, Toni Morrison, Richard Ford, John Updike and Jay McInerney.

English 490. First-Class Seminar. An intensive seminar covering a literary period, literary genre, or major author. Representative period examples are "Coleridge and His Contemporaries," "The Victorian Age," and "American Literature Between the World Wars." Examples of literary genre include satire, short story, novel, lyric poem, and drama. Representative examples of major authors are Milton, Chaucer, Hawthorne, Hemingway, Hurston, and O'Brien.

English 495. Special Topics. Selected topics in English. Previous topics have included Afro-American Literature, Literature by Women, Detective Fiction, Science Fiction and The Roots of Fantasy, Film Studies, Introduction to Linguistics, and Myth and the Hero.

English 499. Independent Study. Study and research in literature, composition, or creative writing.

Environmental Engineering Major



ontaminated water, dirty air, bulging landfills, hazardous waste disposal and contamination clean-up are environmental concerns which are growing in importance each day. The entire country is recognizing the importance of cleaning up past environmental contamination and preventing future pollution from occurring. The Environmental Engineering Major offers cadets a broad environmental engineering education. Cadets in this major will get an understanding of the significant environmental problems facing this country and the Air Force. Course work will include how current environmental problems were created, the impacts of existing problems, how to correct existing contamination and how to prevent future contamination from occurring.



Do you like science and mathematics? Are you interested in improving and maintaining our environment? Do you want a major dedicated to improving the quality of life for everyone? Then perhaps environmental engineering is the major for you . . . to complement your flying career or to give you a satisfying lifelong career. The curriculum at USAFA provides a well-balanced program stressing the fundamentals of the environmental engineering profession. The program is one of a handful accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Upon graduation you earn a Bachelor of Science in Environmental Engineering, a BSEnE.

The operational goals of the Environmental Engineering program include educating future Air Force officers who possess a breadth of integrated, fundamental knowledge in the basic sciences,

engineering, humanities, and social sciences, with a depth of knowledge in Environmental Engineering and broad knowledge in Civil Engineering. The program strives to provide its students with the skills necessary to communicate effectively, demonstrate leadership, work effectively with others and develop into independent, lifelong learners. The program challenges students to apply their knowledge and skills to frame and solve Air Force civil and environmental engineering problems and understand their ethical and professional responsibilities as embodied in the United States Air Force core values. The environmental engineering program is one of the few educational experiences that equips its students with the skills needed to function effectively in contingency operations.

3rd Class Year	2nd Class Year	1st Class Year
Bio 215	AeroEngr 315	Academy Option 1
Civ Engr 210	**Astro 320	Academy Option 2
Civ Engr 330	Bio/Chem/Phy Option	Civ Engr 369
Econ 200	*Civ Engr 351	Civ Engr 405
English 211	Civ Engr 361	Civ Engr 463
Engr Mech 120	Civ Engr 362	Civ Engr 467
Engr/Bas Sci Option	Civ Engr 368	Civ Engr 468
History 202	Civ Engr 390	Civ Engr 469
Math 243	**El Engr 231	Civ Engr 480
Math 245	Law 220	English 411
Mgt 200	**Math 356	Mech Engr 312
Physics 215	Philos 310	MSS 400
Soc Sci 112	Pol Sci 211	

Graduates of the Environmental Engineering program will demonstrate the ability to apply the fundamental concepts of environmental engineering to solve engineering problems and have developed laboratory skills to include the design of experiments, the comprehension of procedures, and the recording, and analysis of data. Graduates will possess engineering design capabilities, including construction processes and the ability to use contemporary environmental engineering analysis, design and testing tools. They will have a command of written and oral communication skills, accompanied by a deep knowledge of their ethical and professional responsibilities as engineers. Graduates will be equipped with a depth of knowledge and skills in environmental engineering and a breadth of knowledge and skills in civil engineering, computers, mathematics, and other disciplines, which allows graduates to effectively identify and solve the types of complex, multidisciplinary problems they will face as Air Force civil and environmental engineers. The educational experience gained in the program highlights the benefits and the skills needed to engage in lifelong learning. Our curriculum enables graduates to become effective multidisciplinary team members, while developing the skills to be an independent learner who knows when to seek help. The broad-based educational experience offered by the environmental engineering program gives graduates a knowledge of their role as Air Force engineering officers in our global society and the knowledge of contemporary, economic, military, ethical, environmental, and engineering issues.

ENVIRONMENTAL ENGINEERING (Civ Engr)

Offered by the Department of Civil and Environmental Engineering.

Civ Engr 210. Air Base Design and Performance. Broad principles of engineering design (including technical, ethical, economic and socio-political considerations) applied to the environment, infrastructure and combat support requirements for air bases during peacetime, humanitarian relief, small scale contingency and combat operations. Guided by an integrated decision-making and systems-design approach, cadets solve projects based on real Air Force problems to integrate the course material and their personal experience. Topics covered were validated based on survey of engineers, educators and operational Air Force officers. The topics

include: environmental impact analysis, (land use planning, environmental quality and airspace issues), infrastructure analysis and design (airfields, utilities and facilities) and combat support with emphasis on beddown, force protection planning and host nation support consideration.

Civ Engr 330. Elementary Structural Analysis. Static analysis of determinate structures: stresses and deformations in beams, trusses, and frames.

Civ Engr 351. Civil Engineering Practices-Field Engineering. Operational visit to an Air Force base and a Civil Engineering wartime training site. Plane surveying to include leveling, closed traversing, crash surveys and global positioning surveys. Introduction to construction materials, design of concrete mixes, and hands on construction using metal, timber, asphalt and concrete and working knowledge of environmental systems. Cadets will construct various projects that they will design in later Civil Engineering courses.

Civ Engr 361. Fundamental Hydraulics. Application of the principles of incompressible fluid mechanics. Topics include: fluid properties, manometry, forces on submerged bodies, open channel flow, and conduit flow. Impulsemomentum, energy methods, Hardy-Cross method for balancing flows in distribution systems and sewer design are also covered.

Civ Engr 362. Introduction to Environmental Engineering. Fundamental theory, principles and preliminary design of unit operations in environmental engineering. Topics include air and water pollution, municipal and hazardous waste treatment, water chemistry, microbiology, mass balance, reactor theory and kinetics, and physical process theory.

Civ Engr 368. Hazardous Waste Management and Contaminant Transport. Combines environmental engineering toxicology and risk management to provide tools for cadets to identify environmental impacts and health problems associated with a variety of activities and substances (e.g. hazardous waste disposal), address groundwater hydraulics and contaminant transport, develop site selection criteria for potentially hazardous facilities, and determine environmental management priorities. The engineering planning and analysis associated with handling, storage, treatment, transportation and disposal of hazardous wastes will be covered.

Civ Engr 369. Introduction to Air Pollution. An in-depth introduction into air pollution covering such topics as the causes, sources and effects of air pollution. Legislative standards (ambient and

source) for pollutants, basic meteorology, air pollution instrumentation and gas flow measurements, design and operating principles of different control technologies and dispersion modeling will be addressed. The course work will involve several laboratory exercises.

Civ Engr 390. Introduction to Soil Mechanics. Engineering properties of soils, soil classification, permeability, consolidation, compaction and shear strength and applications to engineering design. Soils laboratories and reports.

Civ Engr 405. First-Class Seminar. A course designed to give civil engineering majors the opportunity to synthesize and apply the concepts they have learned throughout their undergraduate education. Topics discussed will include those that cadets may encounter in the Air Force after graduation.

Civ Engr 463. Wastewater Treatment Plant Design. Design of facilities for physical, chemical, and biological treatment of wastewater, and treatment and disposal of sludge. Coverage of advanced wastewater treatment and land treatment systems. Laboratory exercises analyzing raw sewage with data being used for the design processes.

Civ Engr 467. Water Treatment Principles and Design. Design of unit operations for coagulation, sedimentation, filtration and disinfection for treatment of drinking water. Introduces the chemistry of drinking water treatment processes. Use of unit operations to design treatment solutions to contemporary environmental problems. Topics include the design of ion exchange, reverse osmosis, chemical precipitation, and selected hazardous waste disposal problems.

Civ Engr 468. Solid and Hazardous Waste Facilities Design. Design and analysis of solid and hazardous waste management systems including collection, transport, processing, resource recovery, and disposal (e.g., the design of landfills and incinerators). Hazardous waste regulations, treatment and site cleanup are addressed.

Civ Engr 469. Design of Air Pollution Controls. Modeling and predicting the effects of air pollution, and the design of the facilities for air pollution control. The designs of electrostatic precipitators, cyclones, bag houses and other methods for the control of air contaminants are addressed.

Civ Engr 480. Construction Management and Administration. This First-Class capstone design course takes students from discipline specific design to integrated project construction. A semester project will serve as a culminating experience and will be based on work designed by cadets in prior or concurrent courses. In Civ Engr 480, cadets will learn how to review and prepare the project for construction through the incorporation of engineering standards and consideration of realistic issues including economic, constructability and environmental aspects as well as sustainability and health and safety constraints. Throughout the planning, estimating and project investigation stages, cadets will consider impacts of ethical, social and political concerns.

Civ Engr 499. Independent Study. Individual study and research in an advanced civil engineering topic approved by the department head.

Foreign Area Studies Major

Poreign area studies is the interdisciplinary study of one of six geo-cultural regions of the globe. Each program centers on intensive language, history, political science, economics, geography, and cultural coursework in a region of specialization, as well as a comparative framework for understanding cross-cultural dynamics. The academic program leads to a Bachelor of Science degree in African, Asian, European, Latin American, Middle Eastern, or Slavic Area Studies. In addition, foreign area studies majors may elect to earn a Foreign Language Minor in Arabic, Chinese, French, German, Japanese, Russian, or Spanish or to further concentrate in economic, geographical, historical, legal, military, or political studies of the region.

Foreign area studies is an inter-departmental major jointly administered by the Departments of Economics and Geography, Foreign Languages, History, and Political Science. Each program's objective is to equip junior officers with a knowledgeable perspective enabling them to be more effective operators in foreign environments, and to prepare them for developing more intensive expertise on foreign cultures during their officer careers.

Things are now much different for Air Force officers since the end of the Cold War. US national security strategy has shifted from a policy of bi-polar containment to strategies of global engagement, partnership, and expanded mutual international security responsibilities. For the Air Force, this new global engagement means a variety of new roles and missions aimed at promoting regional stability, rendering humanitarian assistance, encouraging emerging democracies, and projecting and applying air power

when necessary. Air Force officers, from all career fields and specialties in the twenty-first century, will find themselves working with many cultures and becoming globally engaged, and this global engagement requires global skills. The Foreign Area Studies Major is designed to give future officers broad-based, foreign area-related skills for world-wide service commitments.

Several other programs augment and strengthen foreign area studies at the Academy. Each Spring Break cadet delegations visit another international air force academy. Participant selection is very competitive with priority going to the most serious students. In turn, each April, USAFA hosts the reciprocal visits of cadet delegations from the foreign academies for a week. This Cadet Foreign Exchange Visits Program not only helps bolster our cadets' understanding of foreign cultures but also contributes to cooperative air force-to-air force ties. In recent years, 35 foreign academies have participated in the program. Each fall semester a maximum of 24 cadets participate in a semester exchange program with some of these countries' air force academies, where they experience more extensively the academic, military, athletic and social activities of the host academy. USAFA's semester exchange with France's Ecole de l'air began in 1969. We began an exchange with the German Offizierschule der Luftwaffe in Fall 1999, with the Chilean Escuela de Aviacion in Fall 2000, with the Spanish Air Force Academy in Fall 2001 and with the Canadian Air Force



SUGGESTED COUR	SE SEQUENCE:	
3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	Aero Engr 315	Academy Option 1
Econ 200	Bio 215	Academy Option 2
English 211	Civ Engr 210	Astro 320
For Lang 3	Econ 222	English 411
For Lang 4	El Engr 215	ForArStu Elective
History 202	Engr 310	Geog 310
Physics 215	ForArStu Elective	Integrating Course
Soc Sci 112	For Lang 5	MSS 400
	Research Methods	Philos 310
	Regional History 1	Regional Economic
	Regional History 2	Regional Pol Sci
	Pol Sci 311	Regional Geography
	Poli Sci 394	

Academy in 2002. A Cadet Summer Foreign Language Immersion Program sends our most promising language students for a month to overseas schools for intensive language study. And, finally, our Foreign Area Studies Groups bring cadets and faculty together here at USAFA in a wide variety of extracurricular forums aimed at foreign area studies education.

FOREIGN AREA STUDIES (ForArStu)

Offered by the Departments of Economics and Geography, Foreign Languages, History, and Political Science.

For Ar Stu 400. Summer Foreign Language Immersion. Intensive foreign language and culture study at an accredited foreign university or language institute.

For Ar Stu 410. Model Arab League (MAL). Inter-departmental, inter-disciplinary seminar on contemporary issues on the Middle East, preparing foreign area studies majors for regional or national-level competitions of the MAL. Specialists from various departments introduce historical, geographical, political, socio-economic, cultural, linguistic and literary factors to enhance understanding of a specific region or nation of the Middle East. In addition, enrollees will learn parliamentary and forensic procedures. Portions of the course may be taught in Arabic.

For Ar Stu 415. Advanced Model Arab League (AMAL). Advanced Inter-departmental, inter-disciplinary seminar on contemporary issues on the Middle East, preparing students for regional or national-level competitions of the MAL. Specialists from various departments introduce historical, geographical, political, socio-economic, linguistic and literary factors to enhance understanding of a specific region or nation of the Middle East. In addition, enrollees will serve as class leaders and mentors for first-time students of For Ar Stu 410, Basic Model Arab League. Enrollees of For Ar Stu 415 will serve as focal points during the drafting and presentation of point papers and resolutions during the model competitions.

For Ar Stu 420. Model Organization of American States (MOAS). Inter-departmental, inter-disciplinary seminar on contemporary issues in Latin America, preparing foreign area studies majors for regional or national-level competitions of the MOAS. Specialists from various departments introduce historical, geographical, political, socio-economic, cultural, linguistic and literary factors to enhance understanding of a specific region or country in Latin America. In addition, enrollees will learn parliamentary and forensic procedures. Portions of the course may be taught in Spanish.

For Ar Stu 425. Advanced Model Organization of American States (AMOAS). Advanced inter-departmental, inter-disciplinary seminar on contemporary issues on Latin America, preparing students for regional or national-level competitions of the MOAS. Specialists from various departments introduce historical, geographical, political, socio-economic, linguistic and literary factors to enhance understanding of a specific region or nation of Latin America. In addition, enrollees will serve as class leaders and mentors for first-time students of For Ar Stu 420, Basic Model Organization of American States. Enrollees of For Ar Stu 425 will serve as focal points during the drafting and presentation of point papers and resolutions during the model competitions.

For Ar Stu 430. Model Organizations of African Unity (MOAU). Inter-departmental, inter-disciplinary seminar on contemporary issues in Africa, preparing foreign area studies majors for regional or national-level competitions of the MOAU. Specialists from various departments introduce historical, geographical, political, socio-economic, cultural, linguistic and literary factors to enhance understanding of a specific region or country in Africa. In addition, enrollees will learn parliamentary and forensic procedures.

For Ar Stu 435. Advanced Model Organization of African Unity (AMOAU). Advanced inter-departmental, inter-disciplinary seminar on contemporary issues on Africa, preparing students for regional or national-level competitions of the MOAU. Specialists from various departments introduce historical, geographical, political, socio-economic, liguistic and literary factors to enhance understanding of a specific region or nation of Africa. In addition, enrollees will serve as class leaders and mentors for first-time students of For Ar Stu 430, Basic Model Organization of African Unity. Enrollees of For Ar Stu 435 will serve as focal points during the drafting and presentation of point papers and resolutions during the model competitions.

For Ar Stu 440. Model European Organization. Interdepartmental, inter-disciplinary seminar on contemporary issues in Europe, especially security issues. This course prepares cadets for regional or national-level competitions of the Model NATO or Model EU. Specialists from various departments introduce historical, geographical, political, socio-economic, cultural and civil-military factors to enhance understanding of a specific country or countries in Western Europe. In addition, enrollees will learn parliamentary and forensic procedures.

For Ar Stu 445. Advanced Model North Atlantic Treaty Organization (AMNATO). Advanced inter-departmental, inter-disciplinary seminar on contemporary North American and West European issues, preparing students for regional or national-level competitions of the MNATO. Specialists from various departments introduce historical, geographical, political, socio-economic, linguistic and literary factors to enhance understanding of a specific region or nation of Europe. In addition, enrollees will serve as class leaders and mentors for first-time students of For Ar Stu 440, Basic Model North Atlantic Treaty Organization. Enrollees of For Ar Stu 445 will serve as focal points during the drafting and presentation of point papers and resolutions during the model competitions.

For Ar Stu 470. France in the 20th Century. Inter-disciplinary course taught primarily in French, designed to give foreign area studies majors with a focus on West European and French language studies a better understanding of twentieth century France. It will combine expertise from the Foreign Language, Political Science, Geography, and History departments to present major factors in the history, politics, and culture of modern France and its unique position in the current international system.

For Ar Stu 495. Special Topics in Foreign Area Studies. Interdisciplinary course designed to serve as a capstone or special experience for foreign area studies majors (The following suffixes indicating geo-cultural region of specialization apply: "A"= Asia, "E"= Eastern Europe, "F"= Africa, "L"= Latin America, "M"= Middle East, "S"=Russia or Slavic regions, and "W"= Western Europe). Cultural, literary, linguistic, historical, political, social, economic, geographical, and other pertinent factors bearing on an understanding of the particular region involved are treated by specialists from relevant departments. Portions of the course may be taught in the relevant foreign language.

Foreign Language Minor

All cadets must take two semesters of a foreign language in residence. In addition, you may earn a minor in any of the seven languages taught at USAFA by satisfactorily completing four courses beyond the 100 level while at USAFA. Transfer and validation credit may not be used to meet this requirement. Moreover, to receive the Foreign Language Minor, you must also take a proficiency test during the semester of your last language course. The Foreign Language Minor can often be earned without a course overload.



You may study Arabic, Chinese, French, German, Japanese, Russian, or Spanish—seven of the most important languages in the world. Within each language there is a broad spectrum of courses. The 100, 200, 300 level courses through 321 focus primarily on skills development. The remaining courses enhance and develop a broader based appreciation of a particular culture, history, and literature while providing additional opportunities to develop and refine your language skills. In varying degrees, all foreign language courses

address issues and concerns of future officers serving in the international environment.

Beyond helping to understand culture and broadening your world view, studying a foreign language can influence your military career. In both war and peace, language-qualified officers fill sensitive positions as military attachés at our various embassies, liaison and exchange officers, joint staff officers in the North Atlantic Treaty Organization (NATO) and at Supreme Headquarters Allied Powers Europe (SHAPE) in Belgium, staff officers in Pacific Air Forces (PACAF), intelligence analysts almost everywhere, as well as in the Air Force Office of Special Investigations (OSI). The newly initiated Foreign Area Officer (FAO) Program will provide further opportunities to use your language skills. By speaking a foreign language, you become an "ambassador" helping to shape the opinions that others will have of our country and its armed forces...a crucial role in our increasingly interdependent world.



We make every effort to accommodate cadet preferences, but can't guarantee choices in all areas.

FOREIGN LANGUAGES (For Lang)

Offered by the Department of Foreign Languages.

Supplemental Information:

All cadets who have a background in one of the foreign languages offered at the Academy will take a placement examination upon arrival to determine the appropriate placement level. Based on the results of that examination, cadets will be placed in a language course at the appropriate level. Cadets without prior language background will be placed into an appropriate beginning course.

Course Descriptions

For Lang 131-132. Basic foreign language study with emphasis on comprehension, communicative skills, and structure. Introduction of contemporary culture and civilization of language studied. Language Learning Center (LLC) may supplement classroom instruction. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 141-142. Accelerated basic foreign language study with emphasis on comprehension, communicative skills, and structure. Introduction of contemporary culture and civilization of language studied. LLC may supplement classroom instruction. Designed for cadets with high school language background. (French, German, and Spanish)

For Lang 221. Refinement of grammatical and structural knowledge of target language with emphasis on accuracy in both speech and writing. Intensification of aural and reading comprehension. Student presentations and classroom discussions based on selected readings/topics in culture and civilization of language studied. LLC may supplement classroom instruction. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 222. Continued refinement of grammatical and structural knowledge of target language. Emphasis on conversational practice and aural comprehension of contemporary spoken language. Student presentations and classroom discussions based on culture and civilization readings/topics in target

language. LLC may supplement classroom instruction. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 223. Focus on conversational practice and aural comprehension of contemporary spoken language, with increased attention to reading and writing. Course is designed to more fully develop the four basic language skills. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 321. A capstone skills development course designed to enhance the students' ability to register a base proficiency on DOD proficiency examinations. Intensive practice in speaking, listening, and reading. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 365. Exploration of civilization, culture, and contemporary issues (military, political, economic) of the country or countries concerned. Discussion is in the target language and is based on selected readings in that language. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 376. Survey of important writers, their works, and influences on their societies. Students are provided cultural insights through literature. Discussions are conducted in the target language and based on selected literary works ranging from early times to contemporary periods. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

For Lang 491. A specialized reading and writing course to meet the needs of the advanced foreign language student. Emphasis on stylistics and formal written protocols of the target language. (Arabic, Chinese, Japanese, Russian, French, German, and Spanish)

LANGUAGE SPECIFIC COURSES

German 370. Three Hundred Years of German Immigration to America. More than seven million Germans have come to our shores through the centuries, and today some 60 million Americans one in four - trace their heritage back to German ancestry. This course investigates the reasons why they came and where they settled; and how they were able to endure tremendous hardship only to succeed. The course delves into the economic, social, scientific, cultural, and political contributions that these immigrants have made to the growth and success of these United States of America.

Spanish 371. Current Events in the Spanish-Speaking World. Cadets will experience a semesterlong survey of significant current events in the Spanish-speaking world. They will study and research the cultural, political, economic and historic factors that affect current reality. The course uses available press, television, radio broadcasts and other means such as the World Wide Web to carry out its objectives. Most of the activities of this course are in seminar format, and emphasis is placed in oral discussions and written production.

French 372. Francophone Cultures. Course taught in French on the Francophone movement and the cultures of selected French-speaking countries/regions other than France. In combination with faculty presentations and guidance, cadets will cooperatively research and discuss various French-speaking countries. Francophone Africa will figure prominently. Focus will be on French influence over the historical, political, and cultural aspects of those countries and the status of that influence today in relation to other regional and global systems.

Japanese 372. Japanese Society and Culture. The purpose of this course is to gain a basic knowledge of Japanese society and culture with particular attention to the areas of governmental organization, diplomatic relations, national defense policy and the constitution. Discussions are conducted in Japanese and based on selected readings in Japanese and/or English. Students learn about Japanese government and its constitution. Students compare what they have learned in other Japanese courses, as well as in courses covering the history, politics, and law of other cultures, in order to gain a better understanding of human civilization as a whole.

German 492. German AFA Preparation. Language program with primary emphasis on the development of specific/required language skills and an examination of current cultural, military and political issues. All classes are conducted in the target language.

Spanish 492A. Spanish AFA Preparation. Language program with primary emphasis on the development of specific/required language skills and an examination of current cultural, military and political issues. All classes are conducted in the target language.

Spanish 492B. Chilean AFA Preparation. Language program with primary emphasis on the development of specific/required language skills and an examination of current cultural, military and political issues. All classes are conducted in the target language.

Japanese 492. Japanese AFA Preparation. Language program with primary emphasis on the development of specific/required language skills and an examination of current cultural, military and political issues. All classes are conducted in the target language.

French 492. French AFA Preparation. Intensive language program with emphasis on scientific preparation (mathematics, astronautics, and electrical engineering) and an examination of current French cultural military and political issues. Non-technical portions of this program are conducted in French.

For Lang 495. Special Topics. Selected topics in foreign languages.

For Lang 499. Independent Study. Individual study or research conducted on a tutorial basis. Study may be in any of the seven languages offered by the department.

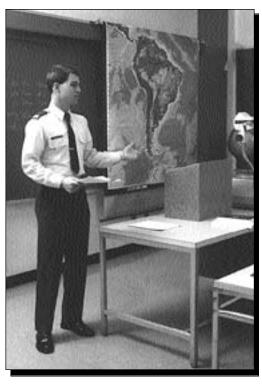
Geography Major

The Geography Major provides considerable flexibility to the cadet desiring to prepare for duties in tomorrow's Air Force. Geographic studies qualify you for a wide variety of Air Force roles ranging from flying to intelligence to weather. Regardless of your ultimate responsibilities as an Air Force team member, the Geography Major will provide a basis for understanding any theater of operations.

The Geography Major offers you a diverse and challenging program focusing on contemporary world problems. A flexible curriculum permits an in-depth study or a cross-disciplinary study of geography and related subjects, including a blend of both traditional and the most contemporary approaches to geographic inquiry. Course offerings represent an excellent cross-section of geographic subfields which are derived from the "four pillars" of geography: physical, human, regional, and geographic tools such as cartography and remote sensing. The Applied Geography Laboratory serves as a focal point for microcomputer-based academic and USAF research projects. You are offered the opportunity to work with state-of-the-art technologies in the fields of spatial analysis, digital image processing, computer-assisted cartography, and geographic information systems.

The operating theater of the USAF includes the entire globe. As a future officer, you will most likely live and work in a foreign country during your career. Your regional geographic studies will provide you with information about foreign places and "sensitize" you to the peculiarities of other cultures. Cadets in the Geography Major can complement their studies with a Foreign Language Minor. The Geography Major will help you develop a firm understanding of the complexities of global interaction as a future decision maker. Tomorrow's leaders must understand the structure and dynamics of the military environment—including the physical and human components.





3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	Aero Engr 315	Academy Option 1
Civ Engr 210	Bio 215	Academy Option 2
Econ 200	Cognate Option 1	Astro 410
English 211	El Engr 215	Cognate Option 2
Engr Mech 120	Geog 320	Cognate Option 3
For Lang 3	Geog 350	Cognate Option 4
For Lang 4	Geog 351	English 411
History 202	Math 300	Geog 310
Law 220	Philos 310	Geog 382
Mgt 200	Pol Sci 211	Geog 442
Physics 110	Regional Option	MSS 400
Physics 215	Systematic Option	Open Option
Soc Sci 112		

GEOGRAPHY (Geog)

Offered by the Department of Economics and Geography.

Geog 310. Geospatial Data Systems. Introduction to the fundamental principles of capturing, processing, storing, and displaying spatial data. Cadets will study the theory and application of spatial data collection, using remote sensing and the global positioning systems. Cadets will also examine the basic functionality of a geographic information system (GIS). Emphasis will be placed on the analytical capabilities of GIS technology across multiple academic disciplines.

Geog 320. Introduction to Cartography. An introduction to the principles and theory of mapmaking. Emphasis is on the design of maps for research and presentations, as well as reading, understanding, and interpreting maps. Both manual and computer generated cartographic methods are studied.

Geog 350. Human Geography. Concentrates on the distribution of cultural characteristics, such as population, migration, language, religion, social customs, political geography, economic development, agriculture, industries, settlements, urban patterns, and resource problems. Yet, physical science concepts are often used to explain spatial patterns of cultural features.

Geog 351. Introduction to Physical Geography. Study of the Earth System (Atmosphere, Hydrosphere, Biosphere, and Lithosphere). Focuses on the spatial distributions within the system, the use of maps to explain the distributions, origins and processes shaping the Earth's surface, and the influence of humans on the Earth system.

Geog 353. Geomorphology. Analysis of dynamic processes, distribution and structure of the Earth's physical features. Focuses on fundamental concepts of physical geology, climate, soils and vegetation.

Geog 355. Field Methods in Geography. Students learn design and execution of geographic field research. Phase I of the course is classroom instruction on the physical, environmental, cultural, and geological aspects of a study site and instruction on specific tools to be used in a field of study. Phase II consists of a week-long field laboratory where students apply their skills in the natural environment. Phase III returns to the classroom where cadets learn various methods of analysis and discuss results.

Geog 360. Environmental Geography. Analysis of air and water pollution, solid and hazardous waste disposal, and soil problems from a geographic perspective. Other topics include population growth, sustainability, environmental change, resource management, conservation, land use, and contemporary environmental policy issues.

Geog 370. Military Geography. Analysis of the significant influence geography exerts on military operations, war, and national security. Examines how the physical, cultural, political, and economic dimensions of geography and meteorology affect the planning and execution of today's military operations.

Geog 372. Economic Geography. A geographic study of global economic processes and how they relate to the world economy. The factors of production, exchange and consumption of goods and services at both the local and international levels are examined.

Geog 382. Remote Sensing and Imagery Analysis. Introduction to the science, art, and application of remotely sensed imagery. The course explores the energy behind photography and electronically sensed imagery, and introduces vertical aerial photogrammetry and multispectrally sensed imagery. Digital image processing techniques are presented and applied using the Applied Geography Laboratory facilities and raster data from commercial spaceborne sensing systems.

Geog 442. Seminar on Geographic Thought and Research Methods. Examines the evolution of geographic thought and the impact of modern technologies on the nature of the discipline. Cadets will complete an outline for a substantive research paper on a topic of their choice. Library and/or field research required.

Geog 470. Geography of Europe. Geographical analysis of the physical and cultural aspects of Western Europe. Topical analyses include demography, language, religion, industry, and geopolitics.

Geog 471. Geography of the United States. Geographical analysis of the physical, cultural, economic, and political diversity of the United States. Focuses on the regional distribution of resources and land uses, economic structure, industrial development, settlement patterns, demographics and other population characteristics.

Geog 473. Geography of Post Soviet Union. Geographical analysis of the physical, cultural, population, and economic base of the Post Soviet Union. Investigates problems of population growth, ethnic/cultural issues uniting and dividing the region, impact of geographic factors on sustainable economic development and environmental issues impacting the region.

Geog 475. Geography of East Asia. Geographic analysis of the physical and cultural landscapes of selected regions of East Asia. Focuses on the regional distribution of resources, economic structure, industrial strength, settlement patterns, and patterns of population growth.

Geog 477. Geography of Latin America. Geographical analysis of the physical, cultural, and economic base of Latin America. Investigates population growth, social issues, and the impact of geographic factors on economic development. Problems and benefits relating to ethnic heterogeneity as well as environmental problems/solutions.

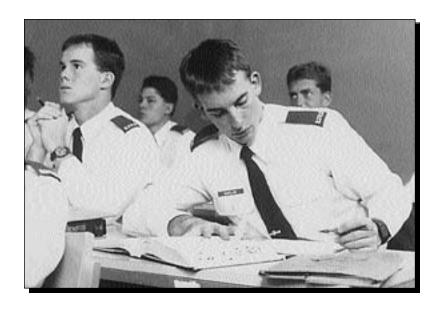
Geog 480. Geography of the Middle East. Geographical analysis of the physical, cultural, economic and political diversity of the Middle East. Investigates the distribution of resources (with special attention given to the increasing importance of water supplies), population, industrial strength, and settlement patterns.

Emphasis on contemporary issues concerning petroleum, Arab-Israeli conflict, economic development, emancipation of women, and Westernization.

Geog 481. Geography of Africa. Geographical analysis of the physical, cultural, economic and political diversity of the African continent with particular emphasis on the Sub-Saharan subregion. Focuses on physical environment, cultural interaction within and between regions and the geographic perspective of the impact of colonization. Investigates problems of population growth, social and ethnic issues, poverty and sustainable development as well as the reasons and causes of internal strife.

Geog 495. Special Topics. Selected topics in geography.

Geog 499. Independent Study. Independent research under the direction of a faculty member.



History Major



An understanding of history is one of the most recognizable traits of an educated person. Regardless of whether you intend to be a professional historian someday, history offers something essential to your life: perspective and meaning. What better way to prepare for the profession of arms than to study those who have gone before us? History allows you to sift through the rubble, determine what is important, exercise judgement and act. History matters.



The History Major helps cadets understand the world and its problems by studying the ideas and forces of the past that have shaped the present. Knowledge of history and enriched understanding of other cultures and ideas are essential to professional Air Force officers, and are particularly valuable for cadets considering careers in operations, plans, attaché duty, and intelligence. Because the History Major emphasizes the development of critical thinking, research techniques, and writing skills, it provides excellent management and leadership training for junior officers aspiring to future staff and command positions.

The History Major is structured so you can plan a diverse study of history or concentrate in one of three areas: General History, American History, or Military History. Each of these options offers wide latitude to select courses that mesh with your personal interests and professional goals. Additionally, completion of a Foreign Language Minor is possible within each of the major options.

History Major Requirements

- 1. History 330.
- 2-3. History 351 AND History 352.
- 4. History 371 OR History 376.
- 5. Appropriate capstone (History 457, 480, or 498; 499 by exception only)
- 6. One area history course (includes all area history courses, 344, 345, 482, and 498 if not capstone)
- 7-11. Any five history courses (four must be military history courses for military history designation; four must be American history courses for American history designation not including History 351 and History 352)
- 12.-15 Foreign Language
- 16. Open academic option

HISTORY (History)

Offered by the Department of History.

History 101. Modern World History. Surveys major pre-modern civilizations and the development and diffusion of modern cultures throughout the world. Focuses primarily on world civilizations since 1200. Examines the interaction of traditional and modern cultures culminating with the turbulent twentieth century. Examines clashes of major ideologies on a global scale, including the role of the United States in the twentieth century.

History 202. Introduction to Military History. Surveys the history of warfare from gunpowder age to the present. Focuses on the evolving methods and theories of warfare in Europe and the United States, and emphasizes how political, social, economic, and technological factors have combined to shape both changes and continuities in the nature of western warfare.

History 320. History of Technology and Warfare. Examines the relationship of technology to warfare on land, sea and in the air from antiquity to the present. Investigates the roots of weapons technology in social, political, and technical contexts. Affords special treatment to the impact of engineering and the industrial revolution on the development of technology and subsequent impacts on warfare. The interrelationship of technology, tactics, and strategy provides the thematic framework. Devotes several lessons to case studies of battles and campaigns that illustrate significant developments.

History 325. History of Christianity. Surveys the history of the Christian Church and its interaction with culture, ideology, politics, economics and society, particularly in the West. Examines the Jewish heritage of the Christian tradition, the establishment of the Church in antiquity, the formulation of doctrine, the relationship between church and state, the issues of the Reformation and Counter-Reformation, and the effects of the Enlightenment, Industrial Revolution, and modern social changes on Christianity up to the present day. Addresses the perspectives of Roman Catholic, Eastern Orthodox, Protestant and other denominational Christians.

History 330. Historiography and Methodology. A history practicum that examines the history of historical writing and enables cadets to improve their research, writing, and presentation skills. Surveys the "Makers of the Past," historians who

have shaped current views of who and what we are as individuals, societies and civilizations. Cadets practice the methodology of historical "detective work," critical analysis of evidence, and professional oral and written presentation skills. The first half of the course emphasizes historiography and methodological case studies. The second half focuses on a research paper of the cadet's choosing.

History 332. History of US Foreign Policy. Examines major developments in US foreign policy from colonial times to the present, with particular emphasis on the twentieth century. Focuses on the motives behind the conceptualization of diplomatic goals, the search for appropriate tactics to achieve policy objectives, and the consequences of US foreign policy at home and abroad. Coursework centers on classroom lecture and discussion, and extensive analysis of interpretive essays and primary documents.

History 335. History of the American West. Examines the special contributions of the American West to the evolution of the United States. Throughout their history Americans have been intrigued and fascinated by their vast frontier. The American frontier served as a granary and a safety valve while helping to shape the American character. This course explores the validity of Frederick Jackson Turner's frontier thesis and the events and ideas that made the West unique.

History 336. History of the American South. Examines the special contributions of the South to the evolution of the United States, and analyzes the major themes of Southern history in the eighteenth, nineteenth, and twentieth centuries. Focuses on fundamental and foundational ideas and values, especially as Southerners have perceived them, and their role in Southern society. Addresses how Southern society evolved differently from the rest of the United States, and seemingly over a century and a half merged with a mainstream America while maintaining a unique identity.

History 338. Colonial Warfare. Examines comprehensively the competition and conflicts that resulted from European explorations and conquests of the fifteenth, sixteenth and seventeenth centuries that erupted into serial warfare in the eighteenth century. These conflicts exposed all sides to different modes of warfare that shaped future combat. The course examines the causes for these wars (with an emphasis on the conflicts in North America), the changes in tactics and strategy

that resulted from the clash of cultures, and the ideologies that sprang from colonization.

History 339. The American Civil War. Examines comprehensively the causes, conduct and legacy of the American Civil War. An indepth analysis of Southern sectionalism leads into a comprehensive discussion of all aspects of the war itself: military, economic, cultural, social, political, technological and ideological. The course concludes by describing the shortand long-term effects of the war on the American military establishment.

History 340. History of Colonial Latin America. Examines the Native American, Iberian, and African origins of colonial civilization, with special emphasis on the stable colonial society that evolved after the Spanish and Portuguese conquests. Examines the nature of pre-Columbian societies, colonial government, labor systems, landholding patterns, the role of the Church in society, and the forces that led to Latin America's independence.

History 341. History of Modern Latin America. Examines the post-1825 period of Latin American history. Explains the independence process and the formulation of major nation states and other major facets of the nineteenth century. Treats major issues of the twentieth century, including political change, industrialization, foreign power influence, military institutions, demographic pressures and the United States' role within different national contexts.

History 342. History of Traditional Asia. A survey of the major political, economic, and socio-cultural developments in Asia (primarily China, Japan, India, and Southeast Asia) from prehistoric times to the arrival of the Europeans in the sixteenth century. Explores the major themes of the traditional foundations of Asia, change and continuity, the structure of the traditional Asian world order, and the impact of contact with the European maritime powers.

History 343. History of Modern Asia. A survey of the major political, economic, and sociocultural developments in Asia (primarily China, Japan, India, and Southeast Asia) from roughly the sixteenth century to the present day. Explores the major themes of the traditional foundations of Asia, the impact of Western imperialism in Asia, the impact of Western ideologies on Asian thought, the importance of technological change, and the significance of political, economic, and cultural leaders.

History 344. Foundations of European History. Examines European history from Antiquity to 1789. Analyzes the major aspects of European development, including classical Greece, the Hellenistic world, the Roman Republic and Empire, the advent of Christianity, the Byzantine Empire, the impact of barbarian invasions, feudalism, the Middle Ages, the Renaissance, the Reformation, the rise of the nation-state and the Enlightenment.

History 345. Modern European History. Examines the defining themes of the late eighteenth, nineteenth, and twentieth centuries in Europe. Focusing on political, ideological, intellectual, cultural, economic, social, military and diplomatic developments, this course traces the history of modern Europe, beginning with the French Revolution and continuing through both world wars to contemporary Europe. Major topics include Napoleonic Europe, the industrial revolutions, European nationalist movements, World War I, the Inter-War Years, World War II, the Cold War, and the demise of monolithic regimes. It concludes with a study of Post-Imperial Europe, and the legacies of the Cold War for contemporary Europe including the current status of NATO and the role of the USAF officer in Europe.

History 346. History of Russia. Examines Russian domestic and foreign affairs from the ninth century to 1861. Studies the ways in which Eastern, Western, and native influences promoted continuity within the Tsarist Russian state, to include: autocracy, church-state relations, imperialism, great power status, foreign power intervention, and modernization.

History 347. History of Modern Russia. Examines domestic and foreign affairs from 1861 to the present. Focuses on the dynamics of Russian society and government from the Great Reforms through the Bolshevik seizure of power. Reviews Communist attempts and the final failure to develop a legitimate Soviet state. Gives special attention to the unique synthesis of military and economic power leading to Soviet "superpower" status and the eventual demise of the USSR.

History 351. The Foundations of Modern America. Examines the political, intellectual, social, and economic origins and development of the United States from the first settlements through Reconstruction. Emphasizes the importance of the colonial experience, the Revolution, the national period, the growth of democracy, westward expansion, and the Civil War and Reconstruction in shaping modern America.

History 352. The History of Modern America. Continues the examination of the political, intellectual, social, and economic development of the United States from the late nineteenth century to the present. Concentrates on the growth of the United States as a major economic and political power. Gives special attention to the impact of industrialization, urbanization, immigration, reform movements, mass culture, domestic economic fluctuations, governmental expansion, and military involvements during the twentieth century.

History 363. Unconventional Warfare. Surveys the evolution, theory, and practice of insurgent and revolutionary warfare throughout the world from the seventeenth century to the present. Examines counterinsurgency operations in various areas and circumstances.

History 367. Ancient, Medieval and Early **Modern Warfare.** Surveys the rise of organized warfare in the Near East, the Assyrian and Persian military systems, hoplite warfare in classical Greece, the Persian Wars, the Peloponnesian War between ancient Athens and Sparta, the Hellenistic era, the Roman Republic, the Punic Wars between Carthage and Rome, the rise and fall of the Roman Empire, the evolution of feudal warfare and its eventual metamorphosis into the earliest forms of modern war. culminating in the age of gunpowder. Includes discussions of the great captains of warfare: Cyrus of Persia, Alexander the Great, Hannibal Barca, Scipio Africanus, Julius Caesar, Belisarius, Charlemagne, and William the Conqueror and the oldest aircraft known to man, the F-4.

History 368. World War II. An intensive study of the largest conflict in human history. Includes a detailed analysis of the causes, ideologies, strategies, technologies, and campaigns of the war. Examines the economic and social implications of the war on various nation states. Major themes include the role of military and political leadership, the nature of coalition warfare, and the role of the modern officer in combat.

History 369. Limited War in the Twentieth Century. Korea and Vietnam. Within the contexts of the superpower system and a nuclear arms race, during the Cold War the United States tried to fight wars that would achieve limited aims with limited means. This military history course examines the forces and campaigns of the Korean and Vietnam Wars. Students will also consider the effects of technology, foreign policy, domestic social and political climates and the long-term implications of American strategy and policymaking.

History 370. World War I. A detailed analysis of the epochal event of the twentieth century. Cadets explore the role of ideology, military and social doctrine, alliance systems, and European militarism on the outbreak and conduct of total war in Europe. Detailed analysis of the disparate military environments of stalemate on the Western Front, deadlock on the high seas, and maneuver warfare on the Eastern Front illustrates tensions between military doctrine and emerging technology. Places special emphasis on the integration of air power and the emergence of modern paradigms for conducting warfare.

History 371. Air Power and Modern Warfare. History of the air weapon with primary emphasis on leadership and tactics as they evolved during the twentieth century. Covers global development of military airpower, stressing the constant interplay among personalities, institutions, theories, technology, combat experience, and evolving doctrine.

History 372. Seapower and Modern Warfare. History of sea weapons with primary emphasis on technology, tactics, and leadership as they evolved from 1000 BC to the present. Global treatment stresses the constant interplay among personalities, institutions, theories, technology, combat experience, and evolving doctrine.

History 373. History of Sub-Saharan Africa. What important roles did the peoples of Africa play in the unfolding story of humankind? How did Africans cope with radical changes to their political, economic, and social institutions in the nineteenth century? This course addresses these questions and discusses the theories behind the origins of Africans civilizations. It shows how Africa's past influenced its response to colonial rule, and how Africans threw off colonial domination in the twentieth century. The course introduces you to modern-day problems of environmental degradation, population growth, debt crisis, security issues and medical challenges in Africa.

History 374. Foundations of Middle Eastern History. Surveys early civilizations in the Middle East and North Africa from the dawn of civilization to the fall of Constantinople to the Ottoman Empire in 1453. Emphasizes the classical empires of the Near East, developments and contributions of Judaism and Christianity, the birth and spread of Islam, the impact of the Crusaders and Mongols on the region, and the rise to dominance of the "gunpowder empires."

History 375. Modern Middle Eastern History. Surveys domestic and foreign affairs of the "greater" Middle East and North Africa from the rise of the Ottoman Empire to the present.

Emphasizes the impact of imperialism, nationalism, constitutionalism, modernization, and reform. Analyzes independence movements of the twentieth century, the Arab-Israeli conflict, the Zionist and Islamic fundamentalist movements, the Gulf War, and other contemporary trends, problems, and challenges.

History 376. A History of Space Power. Conquest of the New Frontier. Surveys the history of space power with primary emphasis on the U.S. and Soviet space programs during the Cold War and beyond, and their origins in the German V-programs of World War II. Examines the interplay among leadership, politics, society, technology, the USAF's complex relationship with this new expression of aerosapce power, and associated doctrinal challenges.

History 394. The American Way of War. Surveys the history of American warfare from the colonial period to the present. Focuses primarily on the nature of American warfare, and addresses whether there is a peculiar American way of war. Addresses such issues as the American attitudes toward war, civil-military relations, force structure, the role of professional leadership and the impact of technology.

History 457. History of Military Thought. Investigates the ideas of selected major military thinkers from the time of Machiavelli to the present. Emphasizes strategists whose impact on evolving strategy and doctrine, whether on land, sea, or in the air, has been most far-reaching.

History 480. Studies in American Civilization. Examines conflict and stability at various historical periods in American society, emphasizing such institutions as government, education, religion, the military, business, the family, media, and sports. Course focus changes each semester.

History 482. History of Science and Technology. Examines contemporary science and technology in terms of its historical antecedents. Addresses science from the pre-Socratic Greeks to the present and traces the intellectual development of scientific and technical revolutions, especially in the seventeenth and twentieth centuries. Interrelationship of physics, mathematics, and cosmology provides thematic continuity in addressing chemistry and the life sciences. The historical relationship between science and technology receives special treatment. The course is designed to suit engineering and science majors as well as those in the humanities. Cadets may tailor research projects to their disciplinary interests.

History 483. Great Americans. Examines the role of the individual in American history. Through the illuminating prism of biography, lives of selected prominent Americans are studied to understand the unique personal qualities that contributed to their success and to determine the extent to which individual actions influence the course of history. Features political, military, business, labor, scientific, and literary figures.

History 495. Special Topics. Selected topics in history.



History 498. Global Dimensions of History. Examines the dynamic forces that influence and shape global history. Explores time, space (geography), politics, economics and society in the context of universal and world history. Devotes special attention to the impact of varying cultural perspectives upon individual historical understanding. Also explores the current process of globalization and its many challenges.

History 499. Independent Study. Reading and research in any recognized area of historical study. Areas selected by instructor depend on cadet interest.

Legal Studies Major

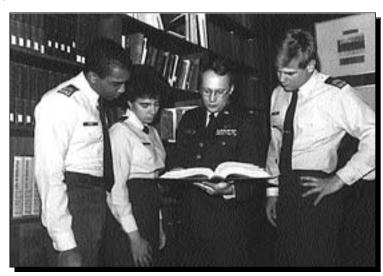
In no country perhaps in the world is the law so general a study.... This study renders men acute, inquisitive, dexterous, prompt in attack, ready in defence, full of resources.... They augur misgovenment at a distance, and snuff the approach of tyranny in every tainted breeze. – Edmund Burke

Legal Studies Major provides a broad liberal arts background upon which a cadet at the United States Air Force Academy may build expertise in the study of law and its role and function in both American society and the international

community. Increasingly, complex legal considerations permeate every aspect of modern life in both the civilian and military environments. Cadets who choose the Legal Studies Major will be able to develop the analytical skills that will permit them to identify, understand, and resolve the complex legal issues that they will likely encounter after graduation. The Legal Studies Major is not a "prelaw" major, but is designed to provide cadets an enhanced knowledge of the law as part of a broadly focused education.

The Department of Law and the Legal Studies Major fall within the Social Sciences Division. Cadets who elect to major in Legal Studies must complete sixteen courses in addition to the thirty courses contained in the core. Four of these majors' courses must be Foreign Language courses, while nine of the sixteen must be selected from those offered by the Department of Law. In addition to courses taught by the Department of Law, a major has

some discretion in taking courses taught by the Departments of Behavioral Sciences and Leadership, Economics and Geography, Management, Philosophy, and Political Science. This program of study is designed to expose the student to a broad range of issues within the discipline of law. It provides a broad liberal arts background upon which an Air Force officer may build specialized expertise in an area of increasing relevance and importance.



3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	AeroEngr 315	Academy Option 1
Econ 200	Bio 215	Academy Option 2
English 211	Civ Engr 210	Astro 410
Engr Mech 120	El Engr 215	Econ Option
For Lang 221	Int'l Law Option	English 411
For Lang 222	Law Option 1	Law Option 3
History 101	Law Option 2	Law 421
History 202	Law 430	Law 451
Law 220	Math 300	Law 485
Law 221	Philos 310	MSS 400
Mgt 200	Pol Sci 211	Ops Rsch 310
Physics 110	Pol Sci Option	Philos Option
Physics 215		

LAW (Law)

Offered by the Department of Law.

Law 220. Law for Air Force Officers. A core course introducing cadets to the legal knowledge and skills they will need as Air Force officers and educated citizens. The course examines the nature of law and its role in American society and the military; provides an overview of the American and military justice legal systems; examines selected foundational constitutional rights, particularly as they apply in the armed forces; and introduces substantive areas of the law that military officers likely will encounter in their personal and official capacities, including criminal law, civil law, military administrative law, and the law of armed conflict.

Law 221. Legal Research, Writing and Advocacy. Following an introduction to the fundamentals of legal research and legal reasoning, students will do various exercises intended to enhance research skills, hone the ability to recognize and articulate legal issues, foster critical analysis and promote effective communication. Students will also practice advocacy skills. The course culminates with the students preparing a legal memorandum or equivalent legal document.

Law 330. Comparative Legal Systems. A comparative study of the world's major legal traditions, including Civil law (French, German, and Japanese), Common law (English and American), Socialist law (China), and those based upon philosophical or religious principles (Islamic, Jewish, Hindu, Tribal African, and Native American); focusing on historical development, court structures, the legal profession, and litigation procedures.

Law 340. Business Law. An in-depth study of the law governing commerce and business organizations in the United States. Emphasis will be placed on contracts, formation of business organizations and laws which regulate the workplace environment.

Law 360. Law and Literature. An in-depth study of selected literary works which deal with law as well as the literary qualities found in court opinions by noted jurists and in editorial journalism. Primary emphasis on developing persuasive writing skills, and secondary emphasis on oral analysis of subject texts.

Law 421. Law for Commanders. This course is a continuation and expansion of Law 220, Law for Air Force Officers. Focus is on legal problems and issues of command and use of command tools. Examines command authority over military personnel, command authority over civilians living or working on base, military administrative law, and common legal concerns facing commanders and commanders' subordinates.

Law 430. Crime and Criminal Justice. An examination of crime and the criminal justice system. Special emphasis on the definition of crime, the criminal justice system and constitutional aspects of criminal law enforcement.

Law 451. American Constitutional Law. An in-depth analysis of Supreme Court decisions having a fundamental impact on the American legal system, government, and citizens. Topics include the legal definition of war power and aspects of the Bill of Rights and the Fourteenth Amendment.

Law 456. National Security Law. An examination of the domestic and international legal authority affecting US national security policy and the command and control of the key instruments of national security, focusing on the US military.

Law 461. International Law. A study of the legal principles which govern relations among nations. Topics include: options for settlement of disputes; the law which affects military operations and the status of US forces stationed overseas; roles and powers of international organizations; and the law of the sea.

Law 471. Environmental Law and Policy. Comprehensive study of federal environmental law and current environmental issues emphasizing impacts on the Air Force mission. Areas covered include air and water pollution, solid and hazardous waste, NEPA, federal public lands, natural resources, and base closure. Course is designed to satisfy the needs and interests of cadets from all academic majors.

Law 485. Contemporary Problems and the Law. A seminar on the legal implications of contemporary social, economic, and political problems and the ability of the American legal system to solve those problems. This course affords the student the opportunity to integrate knowledge and expertise acquired in other law

courses and further hone their analytical skills as they identify and seek to understand and resolve the complex legal issues they are likely to encounter following graduation.

Law 495. Special Topics. Selected topics or topics in law.

Law 499. Independent Study. Study and research in a legal topic or topics of choice for students who

have demonstrated their ability for advanced study in regularly offered enrichment courses. Topics and meetings arranged with the instructor.

Management Major

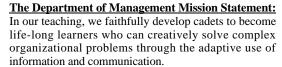
he Management Major equips young officers to manage and lead in today's complex Air Force. The curriculum is designed to provide students with the abiity to understand, analyze, and improve any organization.

The Management Major produces a critical thinker who is able to adapt quickly to a dynamic, highly technical, information rich environment to accomplish the mission. The skills students develop are extremely important for Air Force officers as well as future community leaders.

Management majors study traditional business topics such as accounting, finance, human resource

management, marketing, production and operations, information systems, and strategy. Related subjects, such as personal finance and investments, human behavior, and Air Force acquisition management are also popular.

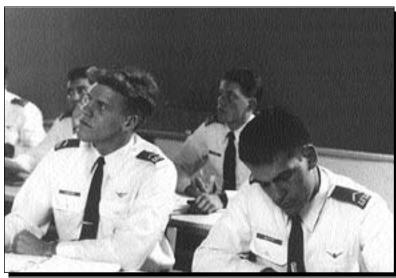
In addition, the Management curriculum provides strong education preparation for those interested in pursuing a Master's in Business Administration (MBA) degree after graduation.



In our pursuit of knowledge, we continually advance and apply innovative, successful business practices.

In our dedication to service, we actively value involvement with the Academy, community, and other stakeholders.

In general, the skills learned in the Management Major will enhance any officer's performance in any position. Many career fields are open to management majors; however, some require and make use of the specific disciplines covered in the Management Major curriculum. Air Force specialties that are most suited for management majors and are achieved through a competitive selection process include: Acquisition Project Officer, Acquisition Contracting Officer, Accounting and Finance Officer, Budget Officer, Cost Analysis Officer, Medical Services Corps, and Personnel Programs Officer.



3 rd Class Year	2 nd Class Year	1 st Class Year
Bio 215	Aero Engr 315	Academy Option 1
Civ Engr 210	English 311	Academy Option 2
Econ 200	For Lang 3	Astro 410
El Engr 215	For Lang 4	Econ 323
English 211	Math 300	Mgt 437
Engr Mech 120	Mgt 303	Mgt 472
For Lang 1*	Mgt 341	Mgt Option 1
For Lang 2*	Mgt 345	Mgt Option 2
History 202	Mgt 361	Mgt Focus Option
Law 220	Mgt Option 1	MSS 411
Mgt 200	Mgt Option 2	Pol Sci 311
Physics 215	Ops Rsch 310	Philos 310
Soc Sci 112		
* For Lang 1 & 2 may be ta	ken fourth-class year.	AS I WAS FOR THE

MANAGEMENT (Mgt)

Offered by the Department of Management

Mgt 200. Introduction to Management. This course focuses on the universality of the management functions of leading, planning, organizing, and controlling an organization so as to efficiently and effectively reach its objectives. Through a survey of critical management topics, students learn to use management functions to analyze and improve organizations and their processes in increasingly complex, ambiguous, and dynamic environments. As we enter the information age, Mgt 200 helps students develop the adaptive capacity required to manage an organizations' resources-ideas, people, equipment, finances, and information. Other topics include decision making, ethical and social responsibilities of organizations, information systems, and personal financial planning for Air Force officers. (Applies to Class of 2006).

Mgt 303. Management Perspectives. This course introduces students to the complex and dynamic nature of the world in which Air Force officers and managers operate. They are introduced to various perspectives that provide multiple insights into how the world functions.

Mgt 341. Financial Accounting. Analysis of business transactions and recording of business data taught from the perspective of understanding the theoretical and practical issues in measurement of income, assets, liabilities and owner's equity. Annual reports are used to perform financial statement analysis. Alternative accounting methodologies permitted under GAAP are explored.

Mgt 342. Managerial Accounting. Focuses on the uses of accounting information by managers. Discusses full cost accounting and responsibility accounting, from the perspective of data collection and analysis, for short and long range decisions. Topics include cost behavior, contribution margin analysis, measurement of cost of goods manufactured, capital budgeting, and management control systems.

Mgt 345. Organizational Behavior. An introduction to individual and group theories of behavior, and their integration into the organization as a whole. Theories of attitude, behavior, and cognition are applied to the understanding of other theories and organizational issues like motivation, stress, productivity, creativity, conflict, decision making, citizenship behavior, and power and politics.

Mgt 361. Management of Human Resources. This course is geared toward the student whose job inevitably will involve responsibility for managing people, along with other organizational assets. HRM planning, job analysis, performance appraisal, compensation, training and development, legal issues in the work place, labor relations and career development are among the topics covered in this

course. Topics discussed relate to both the public and private sectors. Primarily, students will learn how to make decisions based on accurate diagnoses of situations that involve people. A general knowledge of statistical tools and spreadsheets is required.

Mgt 372. Introduction to Investing and Financial Responsibility. This course provides an introduction to the personal financial planning process, budgeting, financial markets, investment vehicles (corporate stocks and bonds, mutual funds), analysis, and an introduction to estate planning. Topics include budgeting, time value of money, risk and return, fundamental and technical analysis of stocks, bond valuations, and the basics of mutual funds. This course is introductory in nature and assumes no prior knowledge of accounting or financial markets.

Mgt 375. Marketing. This course emphasizes how marketing concepts affect consumers, managers, and organizational strategic plans. This course includes the marketing concept, consumer and industrial markets, market research and segmentation, purchase behavior, product planning, channels of distribution, promotion, pricing, and international marketing. Application of contemporary theory to both critical issues in the private and public sectors is stressed through the use of seminars, case studies, field trips, and projects.

Mgt 391. Management Information Systems. A survey of current topics in management information systems. Topics covered include database management, telecommunications, and hardware trends. Students also develop proficiency with current database and spreadsheet applications. Application of contemporary theory to both critical issues in the public and private sectors is stressed through the use of seminars, case studies, field trips, and projects.

Mgt 437. Managerial Finance. A study of financial decisions and their effects on the value of the firm. Emphasis is on developing the concept of risk/return tradeoff. Topics include stock and bond valuation, capital budgeting, cost of capital, dividend policy, and capital structure. Case studies and problems expose the student to current financial problems and their solutions.

Mgt 440. Management Lessons in Literature.

Through a collection of classic and contemporary stories, novels and plays, this course provides a unique perspective of organizational life. The course looks at what authors like Arthur Miller and Mark Twain can tell you about being a more effective manager. Great literature reflects familiar patterns of behavior in a variety of circumstances. But, unlike self-help, inspirational, and how-to manuals, they dispense no advice; they preach no morals; they

prescribe no rules. In a world of turbulent change, the works of literature offer us vivid testimony as to what stays constant in human behavior.

Mgt 446. Complex Social Systems. The internal dynamics of complex organizations and their environmental relationships are treated in this seminar. Organization theories and research conclusions are considered, and learning is confirmed by encountering a diversity of organizational simulations and experiences, with emphasis on organizational diagnosis and design.



Mgt 472. Strategic Management. This course emphasizes strategy formulation and implementation to include such topics as the strategic management process, environmental forecasting and analysis, top level decision making, and strategic control. Application of contemporary theory to both critical issues in the public and private sectors is stressed through the use of seminars, case studies, field trips, and projects.

Mgt 477. Production and Operations Management. This course is an in-depth examination of the issues, strategies, and analytic techniques involved in providing resources to accomplish Air Force missions. The dominant theme is providing quality products on time and at a minimal cost. Areas of study include quality management, cost analysis (supporting DOD Activity Based Costing and Unit Cost initiatives), forecasting requirements, and facility location. Research project and field trip.

Mgt 482. Investing and Financial Responsibility. This course provides an introduction to the personal financial planning process, budgeting, financial markets, investment vehicles (corporate stocks and bonds, mutual funds), analysis, and an introduction to estate planning. Topics include budgeting, time

value of money, risk and return, fundamental and technical analysis of stocks, bond valuations, and the basics of mutual funds. This course assumes a prior knowledge of the principles developed in Financial Accounting and those presented in Managerial Finance.

Mgt 485. Systems Acquisition Management. Introduction to the acquisition process starting with development of a military requirement and continuing through the life cycle of a weapons system. The course examines the acquisition functions, including the roles of each of the functional areas that make up the government acquisition team such as contracting, program control, and engineering. The course uses current issues, problems, and guest speakers to bring "real world" happenings into the course, so that students can see how the process works or fails to work.

Mgt 495. Special Topics. Selected topics in management.

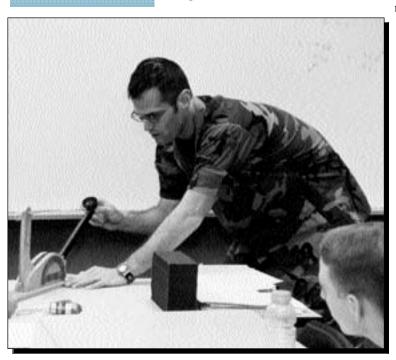
Mgt 498. International Management. As a result of the increase in communications and flow of information, there is a growing need to possess a greater understanding about global, cross-cultural management issues. This course examines management on an international level looking at cultural, legal, financial, and trade considerations for managing in the Global Century, while integrating the functional areas of management.

Mgt 499. Independent Study. Tutorial investigation of a specific area of management.

Mathematical Sciences Major



We've designed the Mathematical Sciences Major to teach you the problem solving and analytical skills you'll need to deal with the complex operational, management, engineering and mathematical problems you'll encounter as an officer in the Air Force of today and tomorrow. You'll take courses in applied mathematics, analysis, statistics and operations research to provide a breadth of education beyond the classical areas of mathematical study. In each of these areas you'll increase your ability to: a) logically analyze a problem; b) determine the tools required to formulate a solution; c) develop and execute that solution. The key to the major in



mathematical sciences is flexibility. It allows you the flexibility to choose the areas you'll study. You have the opportunity to choose one of four specialty options allowing you to study the area of mathematics in which you have the most interest. Each specialty's open options can be filled with mathematics courses or courses offered by other departments. Should you declare a second major, you can substitute courses from your second discipline for your open options. The program also provides enormous flexibility in the opportunities that will be available to you as an Air Force officer. An officer with a background in mathematics has many different AFSCs from which to choose, such as space systems analyst, scientific analyst, experimental test pilot, acquisitions project/program officer, information systems analyst, and intelligence applications officer. This list is certainly not exhaustive since it doesn't include any of the Air Force specialties with no specific degree requirements. You'll also have a firm foundation for graduate work in Operations Research, Physics, most Engineering disciplines, Business Administration, Economics, Computer Science, Law, Medicine, Meteorology, and, of course, Mathematics.

3rd Class Year	2nd Class Year	1st Class Year
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Beh Sci 110	Comp Sci 211	Academy Option 1
Bio 215	Econ 200	Academy Option 2
Civ Engr 210	El Engr 215	Aero Engr 315
English 211	Law 220	Astro 320
Engr Mech 120	Math 342	English 411
History 202	Math 346	Math 405
Math 243	Math 357	Math Option 1
Math 245	Math 358	Math Option 2
Math 320	Math 360	Math Option 3
Physics 110	Math 366	MSS 400
Physics 215	Mgt 200	Philos 310
Soc Sci 112	Ops Rsch 310	
	Pol Sci 211	

MATHEMATICS (Math)

Offered by the Department of Mathematical Sciences.

Math 130. Basic Math - Algebra and Trigonometry. This course is designed to help reinforce algebraic and trigonometric skills necessary for success in Calculus I. This course does not fulfill the math requirements of any major.

Math 141. Calculus I. A study of differential calculus with an introduction to integral calculus. Topics include functions and their applications to physical systems; limits and continuity; a formal treatment of derivatives; numeric estimation of derivatives at a point; basic derivative formulas for elementary functions; product, quotient, and chain rules; and mathematical and physical applications of the derivative, to include extrema, concavity, and optimization. Included is an initial exposure to the concept of antiderivatives, including equations of motion. Other topics include polar coordinates, vector arithmetic, and complex arithmetic.

Math 142. Calculus II. A study of integral calculus with a focus on the Fundamental Theorems and their application. Topics include: estimating area under a curve; antiderivatives; numeric integration methods; antiderivative formulas for the elementary functions; integration by substitution, parts, and tables; improper integrals; differential equations; exponential growth and decay; an introduction to Taylor Series; and mathematical and physical applications of the Fundamental Theorems. Physical applications include area and volume problems and the concept of work.

Math 152. Advanced Placed Calculus II. A more intense study of integral calculus for advanced-placed fourth-class cadets. Content is similar to Math 142, with the addition of an introduction to polar coordinates, vector arithmetic, and complex arithmetic. Additional emphasis is placed on the mathematical and physical applications in preparation for cadets interested in pursuing a technical major or minor.

Math 243. Calculus III. Multivariate calculus, including vector functions, partial differentiation, directional derivatives, line integrals, and multiple integration. Maxima and minima in multiple dimensions and the method of Lagrange Multipliers. Solid analytical geometry to include lines, planes, and surfaces in 3-space. Designed for cadets who indicate an interest in a technical major.

Math 245. Differential Equations and Matrices. Solution methods for first order ordinary differential equations (including numerical methods), second order linear differential equations, higher order constant coefficient linear differential equations (including Laplace transform methods). Also includes systems of linear algebraic equations, Gaussian elimination, matrix algebra and inverses, determinants, and vector spaces.

Math 300. Statistical Methods in the Real World. Introduction to statistics; soundness of statistical studies; categorical versus measurement variables; effective sampling methods; experiments and observational studies. Summarizing and displaying data; normal distribution; relationships between measurement variables (correlation, regression, and causation) and between categorical variables (contingency tables); trends over time. Basics of probability and expectation; the Central Limit theorem; confidence intervals and hypothesis tests; statistical significance. Math 300 stresses the fundamental concepts of statistics, avoids the computational aspects, and is primarily aimed at non-technical majors.

Math 310. Mathematical Modeling. An introductory course in mathematical modeling. Students model various features of given phenomena ranging from supply and demand curves to real-world Air Force applications. Several class periods devoted to in-class work on small projects.

Math 320. Foundations of Mathematics. Spans the gap between freshman calculus and more theoretical courses in mathematics and the basic sciences. Axiomatic structure of mathematics, basic logic, proof theory, sets, relations, functions, and the real and natural number systems. Based on instructor and student preferences, several topics from advanced mathematics are introduced; generally, these topics come from topology, linear algebra, real analysis, modern algebra, and number theory.

Math 340. Discrete Mathematics. Useful for cadets interested in applications of mathematics to computer science and electrical engineering. Propositions and logic; sets and operations on sets; functions, recursion, and induction; graphs, trees, and their applications; discrete counting and combinatorics.

Math 342. Numerical Analysis with Differential Equations. An introductory numerical analysis course with an emphasis on solving differential equations. Specific topics include finite precision arithmetic, root finding, fixed point iteration, interpolating polynomials, solving initial value problems via Runge-Kutta and multi-step methods including systems of equations, and solutions of linear systems of equations. The approach is a balance between the theoretical and applied perspectives with some computer programming required.

Math 343. Computational Matrix Algebra. Properties of matrices and linear transformations, real linear space theory, numerical solution of linear systems of equations, numerical calculations of eigenvalues and eigenvectors, supplementary topics and computational examples as time permits.

Math 346. Engineering Math. Vector calculus: differential (including divergence, directional derivative, gradient, and curl) and integral (including Divergence, Stokes', and Green's Theorem). Systems of linear differential equations, including fundamentals of eigenvalues and

eigenvectors. Introduction to partial differential equations, including separation of variables, Fourier analysis, and numerical concepts.

Math 356. Probability and Statistics for Engineers and Scientists. Classical discrete and continuous probability distributions. Generalized univariate and bivariate distributions with associated joint, conditional, and marginal distributions. Expectations of random variables. Central Limit Theorem with applications in confidence intervals, hypothesis testing, regression, and analysis of variance. Designed for cadets in engineering, sciences, or other technical disciplines.

Math 357. Probability with Applications. Classical, relative frequency, and axiomatic probability; combinatoric and geometric probability; probability laws; uniform and multiple discrete and continuous random variables; transformations; mathematical expectation; families of probability distributions; sampling distributions; and parameter estimation.

Math 358. Statistics. Techniques of statistical inference; hypothesis testing; confidence intervals; analysis of variance; regression analysis; non-parametric analysis; experimental design considerations and introduction to statistical computer software.

Math 359. Design and Analysis of Experiments. An introduction to the philosophy of experimentation and the study of statistical designs. The course requires a knowledge of statistics at the Math 300 level. Topics include analysis of variance for K treatments, various two-and three-level designs, interactions, unbalanced designs, and regression analysis. A valuable course for all science and engineering majors.

Math 360. Linear Algebra. A first course in linear algebra. Vector spaces; linear transformations; systems of linear equations and matrices; eigenvalues and eigenvectors; inner product spaces; spectral theorem and quadratic forms; and the Jordan canonical form. Emphasizes theoretical foundation; computational aspects are covered in Math 343.

Math 366. Real Analysis I. A theoretical study of functions of one variable to include limits; continuity; differentiability; integrability; sequences and series; uniform convergence; Fourier series and convergence; fixed-point theorems and their applications. An essential prerequisite for graduate work in mathematical analysis, differential equations, optimization, and numerical analysis.

Math 405. First-Class Seminar. A course for first-class cadet mathematical sciences majors that provides for presentations of cadet and faculty research; guest lectures; field trips; seminars on career and graduate school opportunities for mathematicians in the Air Force; and group problem-solving techniques.

Math 451. Complex Variables. A valuable course for cadets intending to pursue graduate work in mathematics or its applications, particularly in areas involving partial differential equations. Analytic functions; integration, the Cauchy Integral Theorem and applications; power and Laurent series, residues and poles; conformal mapping with applications to potential theory and fluid flows.

Math 465. Modern Algebra. A valuable course for cadets intending to pursue graduate work in mathematics or its applications. Focuses on the study of algebraic structures and functions between these structures. Topics include: cyclic groups, permutation groups, normal subgroups and quotient groups; rings, ideals, polynomial rings and fields. Depending on instructor and student preferences, applications to coding theory, crystallography, or combinatorics are explored.

Math 467. Real Analysis II. A theoretical study of functions of several variables to include topology of cartesian spaces, compact and connected sets, convergence of sequences and functions, continuous functions, fixed point theorems, contractions, Stone-Weierstrass approximation theorems, differentiation, partial differentiation, mapping theorems, and Implicit Function Theorem.

Math 468. Intermediate Differential Equations. A study of linear and nonlinear differential equations from both computational and theoretical points of view. Topics vary; typical choices include nth order linear equations, systems of differential equations, series solution techniques, stability theory, and Lyapunov functions.

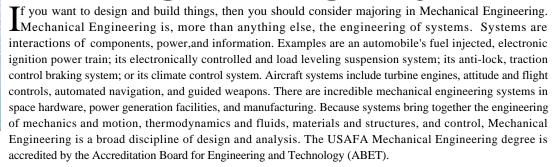
Math 469. Partial Differential Equations. Partial differential equations with applications to heat flow and wave motion. Solutions of boundary value problems. Introduction to Fourier series. Methods of solution include separation of variables and eigenfunction expansion.

Math 470. Mathematical Physics. An introduction to various mathematical topics needed in graduate-level physics and applied mathematics courses. Topics vary; typical choices include special functions (Legendre polynomials, Bessel functions, etc.), calculus of variations, complex functions (Laurent series, contour integration, and the Residue Theorem), Fourier series and their convergence properties, integral transform concepts (Fourier and Laplace transforms, Green's functions), dynamical systems.

Math 495. Special Topics. Selected advanced topics in mathematics.

Math 499. Independent Study and Research. Individual study and/or research under the direction of a faculty member.

Mechanical Engineering Major





The goal of the Department of Engineering Mechanics, which administers the Mechanical Engineering Program, is to *Educate Engineers for the Military Profession*. The Mechanical Engineering program is specifically designed with the goal of generating officers who:

- 1. Possess breadth of integrated, fundamental knowledge in engineering, the basic sciences, social sciences, and humanities; and depth of knowledge in Mechanical Engineering.
- 2. Communicate effectively.
- 3. Work effectively on teams and grow into team leaders.
- 4. Are independent learners, and as applicable, are successful in graduate school.
- Can apply their knowledge and skills to solve Air Force engineering problems, both well and ill defined.
- Know their ethical, professional, and community responsibilities as embodied in the United States Air Force core values.

The Program Operational Goals listed above describe what the Air Force would like to see in our graduates as they begin their careers as Air Force Engineering Officers. To best support these goals our program's curriculum is designed so that, by graduation, our graduates possess certain qualities or outcomes. These Program Curricular Outcomes, listed below, call for our graduating cadets to satisfactorily demonstrate:

- 1. Application of the fundamental analysis concepts of mechanical engineering to solve engineering problems.
- Modeling, design, and fabrication techniques of thermal and mechanical systems under real-world conditions.
- 3. Use of contemporary mechanical engineering analysis, design, and test tools.
- 4. Experimental techniques to include test design, execution, data analysis and interpretation.
- 5. Written and oral communications skills.
- 6. Knowledge of ethical and professional responsibilities.
- 7. Breadth and depth of engineering knowledge and skills to effectively identify and solve the types of complex, interdisciplinary problems they will encounter as Air Force engineers.
- SUGGESTED COURSE SEQUENCE

3rd Class Year 2nd Class Year 1st Class Year Bio 215 AeroEngr 315 Academy Option 1 Civ Engr 210 Econ 200/Mgt 200 Academy Option 2 El Engr 231 Engr Mech 320 Astro 320 **Engineering Option 1** English 211 Engr Mech 350 Law 220 Beh Sci 110 **Engineering Option 2** Engr Mech 330 Math 346 English 411 History 202 Math 356 Engr Mech 405 Math 243 Mech Engr 312 Engr Mech 460 Math 245 Mch Engr 325 or Engr 341 Mech Engr 441 Mech Engr 341 Mech Engr 290 Mech Engr 467 Physics 215 Mech Engr 370 Mech Engr 492 Soc Sci 112 Pol Sci 211 MSS 400 Philos 310

- 8. Ability to be effective interdisciplinary team members and leaders.
- 9. Skills to be independent life-long learners while knowing when to seek help.
- 10. Knowledge of contemporary social, political, military, and engineering issues, as well as the role of Air Force engineering officers and citizens in our global society.

With a degree in Mechanical Engineering you can get an Air Force assignment as an aeronautical engineer, civil engineer, astronautical engineer, mechanical engineer, or project engineer. The Mechanical Engineering degree also satisfies the educational requirements for Air Force Test Pilot, Flight Test Navigator, and Flight Test Engineer duties. Additional specialties are Scientific Analyst and Acquisition Project Officer.

If you are a top performer in the Mechanical Engineering Major, graduate school can be an option as a first Air Force assignment, either by winning a prestigious national scholarship (Guggenheim, Hertz, Rhodes, etc.) or through direct departmental sponsorship. The Mechanical Engineering major gives you the flexibility to pursue either a more specialized degree in graduate school or to continue your broad-based study in engineering. Whether you ultimately choose aeronautical engineering, mechanical engineering, astronautical engineering, materials engineering, or engineering mechanics, your decision will be an informed one.

For more information on the Mechanical Engineering curriculum, please look up our home page at usafa.af.mil/dfem

MECHANICAL ENGINEERING (Mech Engr)

Offered by the Departments of Engineering Mechanics and Aeronautics.

Mech Engr 290. Engineering Design. Application of engineering principles to the creative design process through redesign and original design. Topics include the creative design process, safety, engineering ethics, engineering economy, machine components, basic manufacturing techniques, technical communications, Computer Aided Design (CAD) measurement systems and project management methods.

Mech Engr 325. Engineering System Dynamics. Modeling, analysis, and design of multi-domain engineering systems including mechanical, electrical, hydraulic, instrumentation, and control elements. Models are developed based on tracking power interactions between system components. Mathematical models are developed in state space form and are investigated both analytically and numerically. System response to initial conditions and forcing functions is examined. Tools are introduced to predict system stability, behavior and response to parameter variation. Non-linear models and elementary control systems are introduced.

Mech Engr 341. Fluid Dynamics. Description of fluid matter. Derivation of the governing equations. Application of hydrostatics, boundary layers, pipe flow, computational fluid dynamics, and compressible aerodynamics. Normal shocks and isentropic flow.

Mech Engr 370. Introduction to Machine Design. Introduction to static failure theories and fatigue. Analysis and design of machine components including shafts, hydrodynamic and rolling element bearings, spur gears, clutches, brakes, and springs. Design of joints using screws, bolts, and welds. Emphasis on stress analysis and design trade-offs.

Mech Engr 390. Automotive Systems Analysis. An analysis of the modern passenger automobile as an engineering system. Engineering theory applied to the design, maintenance, and integration of automotive subsystems. Theoretical analyses of power plants, clutches, transmissions, drive trains, suspension systems, tires, brakes, steering dynamics, and overall vehicle performance including economy.

Mech Engr 396. Mechatronics. An integration of mechanical and electrical design, applying the design process to develop an integrated electromechanical system autonomously controlled by a microprocessor. Electrical system development topics include digital logic, actuator control, sensor integration, and signal conditioning. Group design projects throughout the semester leading to the integrated final project.

Mech Engr 441. Heat Transfer and Viscous Flow. Conduction, convection and radiation heat transfer with emphasis on convective heat transfer. Thermal and momentum boundary layers. Analytical and numerical solution techniques applied to selected problems.

Mech Engr 445. Failure Analysis and Prevention. Failure analysis and prevention is a technical discipline that integrates mechanical engineering and materials engineering and structural analysis into component analysis and design. Laboratory techniques including scanning electron microscopy, metallography, x-ray analysis, ultrasonic inspection, and mechanical testing will be used to determine the causes of failures. Redesigns may include changes in geometry, materials selection, or operation to preclude failure.

Mech Engr 467. Energy Conversion. Applications of the first and second laws of thermodynamics to the major energy converters including steam plants, internal combustion engines, and turbojet engines. Additional topics may include combustion analysis, energy storage, refrigeration, and alternate energy sources.

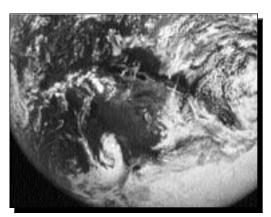
Mech Engr 490. Automotive Systems Analysis for the Engineer. An analysis of the modern automobile as an engineering system. Engineering concepts applied to the design, maintenance, and integration of automotive subsystems. Analysis of power plants, clutches, transmissions, drive trains, suspension systems, steering and braking dynamics, and overall vehicle performance including economy.

Mech Engr 491. First-Class Capstone Design for Intercollegiate Competition. Capstone engineering design experience for students involved with intercollegiate design competitions sponsored by professional engineering societies. Emphasis placed on the design process, complete analysis, and technical communication in the creative development of a mechanical system. The system is designed, fabricated, and tested against performance specifications determined by the societies sponsoring the competitions. Successful project completion results in a field trip to the competition.

Mech Engr 492. First-Class Capstone Design Project. Capstone engineering design experience for the engineering mechanics and mechanical engineering majors. Emphasis placed on the design process, complete analysis, and technical communications in the creative development of a mechanical system. The system is designed, fabricated, and tested against performance specifications determined by faculty members.

Meteorology Major





Meteorology is the study of atmospheric phenomena. The Meteorology Major provides the background necessary for understanding atmospheric behavior over a broad range of time and space scales. These include small features such as turbulent eddies and tornadoes; mesoscale features such as squall lines, hurricanes, and blizzards; and even larger features such as continental weather, climate regimes and waves in the jet stream.

The science of meteorology has changed significantly in the past 30 years. New observing techniques based on remote sensing have improved our understanding of weather phenomena and their interrelationships. Images of the earth from satellites have given us a truly global weather perspective. Doppler radar enables us to look at the circulations within thunderstorms to try to identify whether they might generate a tornado. Coupled with this increased observational capability, the introduction of sophisticated numerical weather prediction models has greatly improved our ability to forecast the weather.

The Meteorology Major requires a strong foundation in physics, geography, and mathematics, and an aptitude for problem solving. Many of the decisions Air Force officers make, from planning troop movements and air strikes in a time of war, to launching the Space Shuttle, flying a sortie, or simply deciding what uniform to wear on a particular day, are affected by the weather. While graduates in the Meteorology Major are academically qualified to enter the weather career field, future pilots and navigators can greatly benefit from a better understanding of the environment in which they fly.

3rd Class Year	2nd Class Year	1st Class Year
Bio 215	Academy Option 1	Academy Option 2
Beh Sci 110	AeroEngr 315	Astro 410
Civ Engr 210	El Engr 215	English 311
Econ 200	Geog 310	Meteor 405
English 211	Law 220	Meteor 430
Engr Mech 120	Math 300	Meteor 431
For Lang 141	Meteor 320	Meteor 440
For Lang 142	Meteor 325	Meteor 451
History 202	Meteor 330	Meteor 452
Mgt 200	Pol Sci 211	Meteor 465
Math 243	Philos 310	Meteor Elective
Meteor 352	Physics 370	MSS 400
Physics 215		Open Option

METEOROLOGY (Meteor)

Offered by the Departments of Economics and Geography and Physics.

Meteor 320. Introduction to Atmospheric Science. A survey course in the fundamentals of meteorology. Emphasis placed on flight weather and its impact on aviation. Topics include atmospheric thermodynamics, cloud physics, air masses and weather systems, weather forecasting, severe weather, hazards to aviation, introduction to weather satellites and radar, and an introduction to space weather.

Meteor 325. Weather Data, Analysis and Quantitative Methods. An introduction to the data sources, objective and subjective data analysis techniques, and quantitative methods used in meteorology. Topics include conventional surface and upper air data, fundamentals of radar and satellite observations, weather map analysis, and quantitative methods covering partial derivatives, vector analysis, kinematic properties of fluid flow, Lagrangian and Eulerian frames of reference, and numerical integration and differentiation. Practical application of the above quantitative techniques to weather charts and vertical atmospheric soundings are emphasized.

Meteor 330. Atmospheric Physics. Classical radiative transfer, thermodynamics and cloud physics applied to the atmosphere. Topics include atmospheric colors, atmospheric absorption and attenuation, the gas laws, the first and second laws of thermodynamics, water-air systems, isobaric, adiabatic and isentropic processes, thermodynamic diagrams, atmospheric statics and vertical stability, atmospheric aerosols, nucleation of water vapor and ice, cloud droplet and ice crystal growth, and precipitation generation.

Meteor 352. Climatology. An introduction to climatology, including fundamental, long-term processes involving energy, moisture and momentum transfer in the earth's climate system. Topics include understanding current world climate patterns and climate change, and applying climatology to enhance human activities.

Meteor 405. First-Class Seminar. A problems course in forecasting. Integrates fundamental meteorological observations with forecasting methodology and synoptic analysis. Focuses on forecasting for the operational Air Force and the role played by weather support to the Air Expeditionary Force (AEF). A series of forecasting exercises culminates in weather support for mock overseas deployment of an operational aviation squadron.

Meteor 430. Atmospheric Dynamics. An advanced course in atmospheric dynamics. Topics include continuity, thermodynamic energy, the equations of motion, hydrostatic balance, generalized vertical

coordinate systems, balanced and unbalanced flows, circulation, vorticity and potential vorticity, and quasi-geostrophic theory.

Meteor 431. Atmospheric Circulation and Energetics. Advanced applications of atmospheric dynamics. Topics include baroclinic instability, cyclogenesis, mesoscale circulations, fronts, frontogenesis, the general circulation, tropical dynamics, dynamics of the middle atmosphere, and numerical weather prediction.

Meteor 440. Synoptic-Dynamic Meteorology Laboratory. A laboratory course emphasizing the use of meteorological observations, analyses and forecasts to describe the structure and dynamics of large-scale atmospheric systems. Involves extensive use of conventional surface and upper-air observations, satellite and Doppler radar data, and numerical forecast products in the meteorology laboratory.

Meteor 451. Synoptic Meteorology. Study of the development and evolution of large-scale weather systems, including surface and upper level pressure, temperature and wind patterns, air masses, fronts, extratropical cyclones and jet streams

Meteor 452. Mesoscale Meteorology. Study of the structure, development and evolution of mesoscale weather systems. Topics include fronts and jet streams, instabilities, gravity waves, convective storms, squall lines, tornadoes, and mesoscale convective complexes. Introduction to analysis techniques and nowcasting. Extensive use of real-time satellite and Doppler radar data and numerical forecast products in meteorological laboratory.

Meteor 465. Marine and Tropical Meteorology. Introduction to the marine environment including the structure of the ocean environment, visibility at sea, and sea-state and swell forecasting, and to the tropical environment including understanding the interactions between the tropics and mid-latitudes, tropical cyclone structure and tropical cyclone forecasting. Particular emphasis will be placed on how these environments affect joint Naval and Air Force operations. Instruction includes Video-Teleconferencing, and computer and web-based learning.

Meteor 470. Aviation Meteorology. A survey course in aviation weather. Integrates fundamental meteorological principles with application to aviation. Topics include atmospheric composition, properties and structure, basic radiative transfer, fundamental atmospheric forces, vertical motion and stability, atmospheric circulation systems, aviation weather hazards and aviation weather resources.

Meteor 499. Independent Study. Independent research under the direction of a faculty member.

Military Strategic Studies Major

Your effectiveness as a military leader will be shaped by your ability to innovate and apply military strategy and doctrine to the variety of operational challenges you will face in a demanding security environment. The Military Strategic Studies program prepares you to operate successfully across the spectrum of conflict. Whether you choose to make the Air Force a career, pursue other public service, or enter the private sector, this versatile major will provide you the knowledge and mindset to compete successfully in any environment.

MSS courses are about the context, theory and application of military power and are taught by one of two squadrons in the Education Group. Your instructors are a diverse, operationally oriented team that includes US Air Force, Army and Navy officers, foreign exchange officers, and civilian professors. While we function as a department, we are organized as a group with squadrons that possess a distinguished combat heritage-the 34th Bombardment Group of the "Mighty Eighth" Air Force during World War II (B-17 and B-24 aircraft, no combat losses) and the 50th Aero Squadron of the American Expeditionary Air Force during World War I (De Haviland DH-4 aircraft, two medals of honor).

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	AeroEngr 315	Academy Option 1
Bio 215	Civ Engr 210	Academy Option 2
Econ/Mgt 200	English 311	Astro 410
El Engr 215	For Lang 3	Geog OR Ops Rsch 310
English 211	For Lang 4	MSS Elective
For Lang 1	MSS 365	MSS Elective
For Lang 2	MSS 379	MSS 395
History 202	MSS 381	MSS 400
Law 220	MSS 382	MSS 466
Math 300	MSS 385	MSS 468
Physics 215	Physics 315	MSS485
Soc Sci 112	Pol Sci 311	MSS 498

The 34th Education Squadron provides you a profession-focused approach to strategic studies, military power, and integration of forces. Military theory, strategy, doctrine, and civil-military relations enable you to frame and evaluate any battle space from a combination of air, information, space and surface perspectives.

The 50th Education Squadron focuses on the application of aerospace power. Courses in military and air and space

operations provide you the conceptual basis to exploit the battle space to achieve military objectives in support of operational and strategic goals. Moreover, our academic divisions incorporate learning laboratories that accentuate the material explored in the classroom. For example, academics associated with combat aviation are demonstrated in both flight simulators and in the air. Likewise, we use our planetarium and wargaming center to illustrate the environmental challenges of air and space warfare. You may even qualify to provide flight, ground, or planetarium instruction to fellow cadets.

As an MSS major, you become a member of the 34th Education Group and one of these two squadrons. Our unique organization and resources allow you to build upon the Academy's core curriculum and offers you the opportunity to study professional problems in depth while you integrate relevant knowledge from academic disciplines. Our focused yet flexible approach develops your military expertise as you explore your chosen profession from multiple points of view.

Operations Research Major





Operations Research (OR) is the application of quantitative techniques to managerial decision making. To gain an appreciation for the field, it is necessary to look at the origins of Operations Research.

OR, as a discipline, arose from the need to determine optimal resource allocation and assist decision-makers during the Second World War. Groups of mathematicians, physical scientists, and economists were assembled during the war to perform studies that would provide quantitative input for commanders. The results of their efforts were impressive and, soon thereafter, the commercial sector realized the power of these new planning techniques.

The use of mathematics to model real world systems was nothing new; physicists and economists had been doing this for years. What defined this new field called OR was its focus on the operations of organizations. Not only were traditional mathematical modeling methods used, such as statistics and probability, but new modeling methods were created, such as mathematical programming and queuing theory.

Operations Research, therefore, entails the development of new quantitative modeling methods and the application of these and existing models to real management problems. This is an exciting field and one that attracts curious problem-solvers who are strong in mathematics and computer science and are eager to solve real world problems.

The description of Operations Research provided above highlights OR's interdisciplinary nature. USAFA has captured the essence of the field by establishing a truly interdisciplinary major. The OR program is jointly administered by the Departments of Management, Mathematical Sciences, Computer Science, and Economics and Geography. In addition to the core set of OR courses, your required courses will include courses from each of the four departments.

During the spring of your first-class year, you will be enrolled in a capstone course which will involve you in a major project as a member of a small team. This project will give you an excellent opportunity to apply all you've learned to an existing Air Force problem. Graduates have indicated that the capstone course is the most valuable learning experience in the major.

If you do well you should plan on attending graduate school at some time in your career. If selected, the Air Force will fund your education, either at the Air Force Institute of Technology or other high quality university. You will go into that program with a significant advantage over other students because you will have been exposed to the classical OR problems and solution techniques.

3rd Class Year	2nd Class Year	1st Class Year
Econ 221	Comp Sci 301	Comp Sci 364
Math 243	Comp Sci 362	Econ 465
Math 357	Econ 333	Econ 466
Comp Sci 210	Math 343	Ops Rsch 390/405
	Math 358	Ops Rsch 411
	Ops Rsch 310	Ops Rsch 420
	Ops Rsch 321	Ops Rsch Option 1
		Ops Rsch Option 2

OPERATIONS RESEARCH (Ops Rsch)

Offered by the Departments of Computer Science, Economics and Geography, Management, and Mathematical Sciences.

Ops Rsch 310. Systems Analysis. This course provides an introduction to rigorous quantitative modeling methods that have broad application. The course focuses on the mathematics of the models, the computer implementation of the models, and the application of these techniques to problems in a wide range of disciplines, the course is relevant to technical and non-technical majors at USAFA. The course consists of six distinct blocks: decision analysis and utility theory, linear and nonlinear optimization, project management, queuing theory, simulation, and the systems approach to engineering and decision-making. Administered by the Department of Management. Instruction provided by inter-departmental Operations Research faculty.

Ops Rsch 321. Probabilistic Models in Operations Research. Operations Research II. Selected probabilistic models (such as random walks, Markov Chains, queues, inventories, and reliability models) are analyzed as stochastic processes. Administered by the Department of Mathematical Sciences.

Ops Rsch 390. Case Studies in Operations Research. The study of methodologies associated with business and operations management. A case-based course intended to provide the proper foundation needed to conduct effective analyses supporting a variety of scenarios. Students will evaluate various cases, develop plans for and conduct analyses, and create effective written and oral presentations.

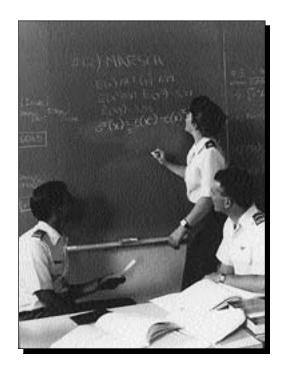
Ops Rsch 405. First-Class Seminar. A course for First-Class Operations Research majors that provides for presentation of cadet and faculty research; guest lectures; field trips; seminars on career and graduate school opportunities for scientific analysts in the Air Force; goal setting exercises; and applications of Operations Research.

Ops Rsch 411. Mathematical Programming. Operations Research III. Topics include linear programming (with sensitivity analysis and applications), and non-linear programming. Both the theory and the computer implementation of these techniques are addressed. Administered by the Department of Mathematical Sciences.

Ops Rsch 420. Capstone in Operations Research. Operations Research IV. Capstone course in OR. Case studies in advanced OR techniques with emphasis on problem recognition, model formulation, and Air Force applications. Administered by the Department of Management.

Ops Rsch 495. Special Topics. Selected advanced topics in OR. Offered by all sponsoring departments.

Ops Rsch 499. Independent Study. Individual study and/or research in OR, under the supervision of a faculty member. Offered by all sponsoring departments.



Philosophy Minor



he Philosophy Minor requires a minimum of 151 hours and four philosophy courses in addition to Philosophy 310.

Because philosophy courses can often be used to fulfill a major's requirements in other disciplines, the philosophy minor can sometimes be earned by taking only one or two additional courses.

"Philosophy" is not another discipline. Rather, it is rational inquiry into any discipline (e.g., philosophy of psychology, philosophy of history, philosophy of

law).



Philosophers seek answers to the basic, fundamental questions, which underpin any field of study.

In addition to the questions addressed in the core course about how we should live our lives, philosophers also study: principles of language and reasoning (logic) foundations of empirical discovery and other ways of knowing (epistemology); and the ultimate underpinnings and structure of the self and the world (metaphysics).

COURSE REQUIREMENTS:

- A. Four courses (12 semester hours) beyond Philosophy 310 in which the student earns a grade of "C" or better.
- B. Required courses include:

1. Philos 390 The Great Philosophers

2. One of the following logic courses:

Philos 360 **Applied Reasoning**

Philos 370 Introduction to Symbolic Logic

3/4. Any two philosophy courses not taken above.

Physics Major

Physics involves the study of the small and very small (atoms, molecules, nuclei and elementary particles), the large and very large (the Earth, Moon, solar system, stars, galaxies, and the universe), the strange (black holes, anti-matter and superconductivity), the common (swings on playgrounds, springs and wheels), the relevant (space systems sensors and the motions of aircraft and satellites), and just about anything else! In other words, the scope of physics is limited only by the

imagination of the physicist. Because the scope of physics is so broad, a physicist must be a generalist who can see the underlying connections between diverse topics. As a result, the Physics Major concentrates on the basic physical and mathematical principles that help us understand the world. This is also why the Physics Major is so flexible; your vision can help you design a Physics sequence that fits your role as an Air Force officer. The Physics curriculum blends traditional academic instruction, practical laboratory work and independent research projects to develop your ability to think creatively and analytically. The Physics Major has a reputation for being challenging, but its rewards are great. It will prepare you for a successful career in the increasingly technical Air Force and reward you with satisfaction coming from mastering a rigorous, demanding discipline. Physics is never obsolete; it forms the foundation upon



which new technologies rest. Whether operational or scientific in nature, the technical innovations in today's Air Force have physics as their fundamental element.

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	AeroEngr 315	Academy Option 1
Bio 215	Econ 200	Academy Option 2
Civ Engr 210	Law 220	Astro 320/410
El Engr 231	Math 346	English 411
English 211	Mgt 200	Math 469
History 202	Philos 310	MSS 400
Math 243	Physics 341	Physics 405
Math 245	Physics 355	Physics 421
Math 356	Physics 356	Physics 442/480
Physics 215	Physics 361	Physics 465
Physics 264	Physics 362	Physics Option 2
Soc Sci 112	Physics Option 1	Physics Option 3
	Pol Sci 211	Physics Option 4

Physics majors serve the Air Force in a wide range of fields. They are pilots, navigators, weapons directors, missile combat crewmembers, flight test engineers, intelligence officers, acquisition managers, nuclear engineers, and of course physicists. Air Force physicists are primarily assigned to Air Force Materiel Command (AFMC) to conduct and manage weapon system research and development. In AFMC laboratories, Air Force physicists conduct research in a number of fields including the near-Earth space environment, laser physics, materials science, optical physics, nuclear physics, and fluid dynamics. In AFMC System Program Offices, Air Force physicists manage and direct the acquisition of numerous weapon systems to include electro-optics, space satellites, highenergy lasers, stealth technology, and nuclear weapons.

Outside of AFMC, the Air Force physicist can be assigned to such diverse agencies as the Missile Defense Agency, Defense Special Weapons Threat Reduction Agency, the Defense Intelligence Agency, Air Intelligence Agency, Air Force Office of Scientific Research, the Department of Defense Advanced Research Projects Agency, and various offices within the Secretary of the Air Force. Finally, the Air Force physicist will be found teaching at the Air Force Academy and the Air Force Institute of Technology.

PHYSICS (Physics) Offered by the Department of Physics.

Physics 110. General Physics I. Introductory calculus-based physics course with emphasis on contemporary applications (first semester). Topics include Newtonian mechanics; conservation of energy, momentum and angular momentum; oscillations and waves; and special relativity. Emphasizes the use of vectors and calculus in problem solving. Course includes inclass laboratories and computer applications to highlight key concepts.

Physics 215. General Physics II. Introductory calculus-based physics course with emphasis on contemporary applications (second semester). Topics include electrostatics, simple DC circuits, magnetic fields, electromagnetic induction, electromagnetic waves, physical optics, and selected topics in modern physics. Uses vectors and calculus in problem solving. Course includes in-class laboratories and computer applications to highlight key concepts. Course must be taken in the semester immediately following the successful completion of Physics 110.



Physics 264. Modern Physics. Introduction to the special theory of relativity and a historically based development of quantum theory. Investigation of Bohr model of the atom. Introduction to quantum mechanics and its application to problems involving simple forms of potential energy. Possible application topics include atomic and molecular physics, solid state physics, nuclear reactions and decay, and elementary particles.

Physics 310. Principles of Nuclear Engineering. A survey course in aerospace uses of nuclear energy. This course introduces the student to the sources and uses of nuclear energy from radioactive decay, fission, and fusion. It covers such topics as nuclear space propulsion and power; ground-based nuclear power; the production, effects, and detection of nuclear weapons; the protection of man and aerospace assets from nuclear radiation; and the safe disposal of radioactive waste.

Physics 315. Aviation Physics. A broad-based study of the principles of physics as they directly apply to the world of combat aviation. The course covers two topical areas: the physics of flight as a dynamic investigation of forces and energy applied to the combat maneuvering required to win air-to-air engagements; and the combat use of the electromagnetic spectrum, primarily as it applies to radar, IR seekers, and countermeasures. A possible third topic would be a brief introduction to atmospheric physics with an emphasis on aviation hazards and weather resources available to aviators.

Physics 341. Laboratory Techniques. An introductory laboratory course developing skills in experimental techniques and data analysis. Course includes instruction in the use of various types of electronic instrumentation and devices to analyze and design electrical circuits. Experiments will investigate the laws and principles of modern physics taught in Physics 264.

Physics 355. Classical Mechanics. An examination of the underlying classical laws governing the general motion of bodies. The topics covered include vector calculus, Newtonian dynamics, Lagrangian and Hamiltonian dynamics, the law of gravity and central-force motion, two-particle collisions and scattering. Possible other topics include linear and coupled oscillations, noninertial reference frames, chaos, transformation properties of orthogonal coordinate systems, and rigid-body motion. Extensive application of calculus, ordinary differential equations, and linear algebra will be made in the solution of problems.

Physics 356. Computational Physics. An introduction to solving complex physical problems using numerical techniques. Subjects covered may include: kinematics, damped/driven oscillators, nonlinear dynamics, coupled oscillators, waves, thermal diffusion, and electromagnetic potentials. Methods presented include regression analysis, numerical differentiation, and solutions to ordinary and partial differential equations.

Physics 361. Electromagnetic Theory I. Develops Maxwell's equations and basic principles of electromagnetism. Includes electrostatic fields in both vacuum and in dielectrics, the Laplace and Poisson equations, magnetic fields associated with constant and time varying currents, and magnetic materials.

Physics 362. Electromagnetic Theory II. Application of Maxwell's equations: plane waves, reflection, refraction, guided waves, electric and magnetic dipoles and quadrupoles, and antennas. The interaction between plane waves and plasmas is treated. Basics of relativistic electrodynamics are introduced.

Physics 370. Upper Atmosphere and Geo-Space Physics. A survey course on the composition and physics of the upper atmosphere and near-Earth environment. Topics include solar-terrestrial interactions; observations, phenomena, and military operations in the near-Earth environment; structure, dynamics and transport

in the upper atmosphere; and energy transfer, remote-sensing, and military operations in the upper atmosphere.

Physics 371. Astronomy. A calculus-based study of the fundamental concepts of astronomy. Emphasis is placed on understanding the basic physical concepts that explain stellar structure, stellar evolution, galactic structure, the solar system and the origin of the universe. Includes up to three night classes at the Academy observatory.

Physics 391. Introduction to Optics and Lasers. A survey course in optics. Including geometrical optics (lenses, mirrors, ray tracing, and optical instruments); physical optics (interference, diffraction, polarization, spectra, and scattering); introduction to lasers (laser operation, pumping, resonators, and optical cavities); and contemporary topics (Fourier optics, imaging, and holography).

Physics 393. Solid State Physics. Introduction to the physics of the solid state nature of matter. Crystal structure, crystal binding, lattice vibration, free electron theory and band theory. Basic introduction to quantum theory and quantum statistics of solids. Theories are used to explain metals, semi-conductors, and insulators. Survey topics include magnetism, superconductivity, optical phenomena in solids, crystal imperfections, and the physics of solid state devices.

Physics 405. First-Class Seminar. A problem solving course reviewing major areas of undergraduate physics.

Physics 421. Thermal and Statistical Physics. Classical thermodynamics with an emphasis on thermodynamic laws and applications to cycles. Kinetic theory, statistical thermodynamics, and quantum statistics. Applications of statistics to quantum systems.

Physics 442. Advanced Physics Lab. A series of selected experiments to develop the student's laboratory skills and reinforce basic physical concepts. Possible topics covered include atomic and molecular physics, gamma ray spectroscopy, laser physics, proton-induced elementary nuclear reactions, x-ray crystallography, optical interferometry and holography, and nonlinear optical processes. The experiments are performed by small groups of students working as a team. Emphasis on the ability to write and brief technical subjects to a technical audience.

Physics 451. Plasma Physics. A comprehensive introduction to the plasma state of matter. Topics include single particle motion, adiabatic invariants, fluid description of a plasma, waves in plasmas, kinetic theory, diffusion and resistivity, and stability.

Physics 453. Solar-Planetary Interactions. Discussion of the basic physical principles controlling the sun's interaction with planetary atmospheres. Topics include the dynamics and structure of the solar atmosphere, origin of the solar wind, and the interaction of the solar wind with space vehicles, Earth-based systems and the Earth's plasma environment. Quantitative descriptions of electric currents and fields, and

auroral and atmospheric dynamics will be

introduced.

Physics 465. Quantum Mechanics. Basic principles of quantum mechanics. Postulates. Dirac notation. Schrodinger's equation. Operators, eigenfunctions, and eigenvalues. Potential barriers and wells. Simple harmonic oscillator. Orbital and spin angular momentum. Addition of total angular momentum. Hydrogen atom. Elementary radiation theory. Time-independent perturbation theory. Two-level systems. Stark effect. Fine structure.

Physics 468. Atomic and Nuclear Physics. Treatment of the fundamental physical concepts governing all of microscopic physics which includes elementary particle, nuclear, atomic, and molecular physics. The topics covered include the standard model of elementary particles and interactions, symmetries and conservation laws, gauge theories, properties of the nucleus, nuclear models, nuclear interactions and decays, scattering theory, atomic systems, atomic and molecular spectroscopy techniques.

Physics 480. Astronomical Techniques. Introduction to optical astronomy using the USAFA 24" and 16" telescopes during nine scheduled night laboratories. Emphasis on equipment operating principles, scientific method, data reduction, and reporting results. Includes astrophotography, photoelectric photometry, charge coupled devices, and spectroscopy.

Physics 482. Laser Physics and Modern Optics. A detailed study of the operation of the laser: types of lasers, lasing media, pumping mechanisms, resonators and cavities, laser modes, and Gaussian properties. Covers modern optics, introductory electro-optics, nonlinear optics, statistical optics, and quantum mechanical analogs of optical systems.

Physics 486. Astrophysics. Applications of physics to astrophysical problems and topics of current interest in astrophysics. Typical topics include stellar structure and evolution, supernovae, white dwarfs, neutron stars, black holes, galactic structure, active galaxies, quasars, cosmology, and general relativity. The choice of topics depends on instructor and student preferences.

Physics 495. Special Topics. Selected topics in physics.

Physics 499. Independent Study. Individual research under the direction of a faculty member.

Political Science Major

The Political Science Major is designed to develop Air Force officers with a comprehensive understanding of both the substance and process of politics and public policy. The major is uniquely capable of preparing future Air Force officers to comprehend the political events, both domestic and international, that will shape their careers.

The Political Science Major is very flexible, allowing students to study areas in depth or to study a wide variety of political topics. In addition, cadets who wish to earn a Foreign Language Minor may count three upper-level language courses as Political Science electives. This option is particularly valuable for cadets who concentrate in comparative politics and/or area studies. The major also offers other areas of concentration: American politics, international relations, and national security policy.

The Political Science Department oversees the Center for American and Comparative Defense Studies and the Wesley W. Posvar Chair. The Center's mission is to develop, sustain, and enhance America's future Air Force leaders' understanding and appreciation of American and comparative defense and national security policy through education and research.

3rd Class Year	2nd Class Year	1st Class Year
Beh Sci 110	Bio 215	Academy Option 1
Econ 200	Civ Engr 210	Academy Option 2
English 211	El Engr 215	Aero 315
Engr 100	English 411	Astro 410
Engr Mech 120	Math 300	Geog 310
For Lang 3	Philos 310	MSS 400
For Lang 4	Pol Sci 300	Pol Sci 491
History 202	Pol Sci 301	Pol Sci Option 2
Law 220	Pol Sci 390/392/394/396*	Pol Sci Option 3
Mgt 200	Pol Sci Option 1	Pol Sci Option 4
Physics 215	ACTORPOSITOR PROPERTY OF	Pol Sci Option 5
Pol Sci 311	*Three of these four	Soc Sci Option



A political science background prepares you to be a more effective Air Force officer in any career field. It helps you understand the international political system—the primary medium that military power is designed to influence. Majoring in political science also develops your abilities to conduct research, communicate, think critically, and understand your role as a military officer. It will provide you with a better understanding of decision-making and policy-making processes that will affect your whole career. Finally, during any deployments or assignments to overseas locations during your career, an understanding of the international political system and American national security policy will help you exercise effective leadership.

The major is particularly well-suited for cadets who want to pursue careers in operations, intelligence, counter-intelligence, plans, foreign and military assistance, politico-military affairs, and attaché duty. A large number of political science majors who do not enter operations choose the intelligence career field, where a knowledge of politics and security issues is of great value.

POLITICAL SCIENCE (Pol Sci)

Offered by the Department of Political Science.

Soc Sci 112. Geopolitics. This integrated interdisciplinary core course investigates the relationship between geographic and political factors. Through discussion of atmospheric, physiographic and cultural processes, it describes their impact on the physical and cultural foundations of the international system. It examines the fundamentals of international politics and how states and other actors seek to pursue their interests in that system.

Pol Sci 300. Introduction to Political Science: Overview and Methods. Provides an introduction to the discipline. This course introduces students to the methods used in political science, placing emphasis on the process of research design—from coming up with a hypothesis, to determining how to test that hypothesis, to how to present the conclusions of the research. The research approaches presented in this class are essential to the political science major, and of great benefit to cadets in other majors that require the systematic examination of research questions.

Pol Sci 301. Political Theory. Provides an overview of political thought from the ancient Greeks to the present. Philosophers studied include Plato, Aristotle, Augustine, Aquinas, Machiavelli, Hobbes, Locke, Montesquieu, Rousseau, Marx, and Nietzsche. Examines debates important for airman-scholars, about human nature, the best regime, justice, equality, freedom, community, religion, power, and natural rights. Also examines the foundations of the other political science sub-fields—American, international relations, comparative, and national security politics.

Pol Sci 311. Politics and American Government. This course develops students' study of politics and government by examining the principled, constitutional foundations and character of American government, and by considering the ideological, structural, and procedural choices and challenges faced by citizens and other participants in the political order. Special emphasis is given to an understanding of the foundations and traditions of American democracy and to the institutions, civil rights and liberties, policy outputs, and defense and national security policy of the American political order.

Pol Sci 390. International Relations Theory. Introduces the basic concepts of international relations. Major theoretical approaches to the analysis of international politics (realism,

liberalism, and globalism) will be used to explore the nature of the international system and various aspects of state behavior in their historical and contemporary settings. Among the subjects examined within this framework: the formulation of foreign policy, mechanisms of conflict and cooperation, the origins of war, issues of international interdependence, international political economy, and questions of international ethics.

Pol Sci 392. American Political System and Theory. Explores the origin and development of American political ideas and institutions. This course examines the notion of American exceptionalism and the design and operation of the American system. Topics include: American constitutional design and its consequences; the expression of preferences; the analysis of institutional behavior; and the policy process.

Pol Sci 394. Comparative Government and Politics. Introduces major theoretical approaches to the comparative study of politics. Applies these approaches to topics such as government institutions, political participation, and social change as they relate to various state and non-state actors. Also includes case studies of important nation-states to illustrate comparative principles.

Policy. Traces the dominant themes in US foreign and security policy as America's position has evolved after World War II. Analyzes the relationship between values and interests in the development of US foreign policy towards allies and potential adversaries. Emphasizes the problems associated with diplomatic, economic, and military instruments of power, and the effects of the pluralistic decision-making process. Will include an examination of the formulation of national strategy and a look at defense budgeting and force planning.

Pol Sci 421. International Security: Political Violence and Terrorism. Applies theories of international security to the roots and forms of political violence in a globalized era. Examines the sub-national and transnational sources of conflict as well as the impact of globalization on the character of collective violence. Investigates the emergence, motivations and strategies of violent non-state actors with emphasis on ethnopolitical groups, militant religious movements, transnational criminal organizations, warlords and insurgencies. Focuses on the use of terrorism to achieve political objectives.

Pol Sci 423. War Crimes, Genocide, and Human Rights. This course explores historical, legal, and political perspectives on the law of armed conflict and the development of human rights law. The Nuremberg Tribunal, the Holocaust, the Cambodian and Rwandan genocides, the My Lai incident, and experiences of prisoners of war are used as case studies within this framework. Resistance movements are also examined. The course is team taught by members of the Political Science, Law, and History departments, and can be used as a social science elective or an elective in any of these three departments.

Pol Sci 444. International Political Economy. Explores the theory and practice of how economic motives affect political decisions and how most political decisions have economic repercussions, both domestically and internationally. Specific topics include the development of the international monetary system, international trade policy, the effects of multinational corporations, foreign direct investment, development of the Global South, the use of economic sanctions as national security policy, and contemporary issues such as the recent Asian financial crisis.

Pol Sci 445. International Organizations and Global Issues. Examines the role and interrelationships of international organizations, nation states, and non-state actors in the global system. North-South and East-West relations are discussed in terms of pertinent global issues: crisis management, conflict resolution, human rights, refugee problems, international finance, world trade, and economic aid programs.

Pol Sci 451. American Political Thought. A survey of basic themes in American political thought beginning with the seventeenth century European origins of American political thought and extending to modern attempts to strike a balance between individual rights and social needs. The focus is on the difficulties of translating principles into practice.

Pol Sci 460. Comparative Security Policy. Studies the security policies and policy-making processes of various world regions as well as the national and regional implications of both traditional and nontraditional security issues. Specific cases examine numerous security challenges facing today's nation-state and develop individual skills in analyzing national security priorities.

Pol Sci 462. Politics and Intelligence. Explores the character of secrecy in the American democratic system. This course investigates the role of intelligence in the development and implementation of US national security policy. Focuses on the key players in the intelligence community, the capabilities of intelligence systems, the tradecraft of spying, and the core intelligence functions of collection, analysis, covert action and counterintelligence. Includes examination of the roles and contributions of military intelligence and current issues in the intelligence field.

Pol Sci 465. US National Space Policy. Examines the evolution, influences, and consequences of US national space policy in both its civilian and military aspects. Special attention to the role of NASA and the US Space Command, the development and utilization of the Space Shuttle, and the growing role of space in commercial ventures, global communication, intelligence collection, arms control verification, and strategic defense. Focuses on the relationships among technology, politics, and policy formulation processes.

Pol Sci 469. Politics of the Former Soviet States. Examines historic, cultural, economic, social and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Critically compares the politics, governments and orientations of post-Soviet states and other regional powers. Surveys contemporary regional issues such as ethnic conflict, nationalism and political-economic reforms, with a particular emphasis on security concerns.

Pol Sci 471. Politics of Europe. Examines historic, cultural, economic, social and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Critically compares the politics, governments and orientations of European states and important regional powers. Surveys contemporary issues such as democratization, arms control and regional integration, with a particular emphasis on security concerns.

Pol Sci 473. Politics of Asia. Examines historic, cultural, economic, social, and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Surveys the governments of selected

countries. Examines in particular the influence of Japan and China on regional and global affairs. Includes a survey of contemporary multilateral issues salient in the region, with particular focus on regional security concerns.

Pol Sci 475. Politics of Latin America. Examines historic, cultural, economic, social, and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Selected Latin American political systems are explored in detail. Issues such as political stability, civil-military relations, and democratization are treated as well, along with politico-economic concerns such as developmental strategies, debt relief, and trade relations. Includes a survey of contemporary multilateral issues salient in the region, with particular focus on regional security concerns.

Pol Sci 477. Politics of the Middle East. Examines historic, cultural, economic, social, religious, and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Surveys the governments of selected countries, considering factors such as legitimacy and political development. Includes a survey of contemporary multilateral issues salient in the region, including the Arab-Israeli dispute, with particular focus on regional security concerns.

Pol Sci 479. Politics of Africa. Examines historic, cultural, economic, social, religious, and geographic traits that distinguish this region and shape its domestic political processes and interstate relations. Focuses on the colonial experience, the emergence of independent African states, and the efforts of those states to pursue political systems of selected countries. Includes a survey of contemporary multilateral issues salient in the region, with particular focus on regional security concerns.

Pol Sci 481. American Elections and Political Parties. Examines the nature of the electoral process and the roles that candidates, political parties, public opinion, and interest groups play in the process. Focuses on the role of candidates' election organizations, political parties, professional campaign managers, public opinion pollsters, professional fundsraisers, and media consultants in congressional and presidential campaigns. Special attention is given to the current presidential or congressional elections.

Pol Sci 482. The US Supreme Court. The Supreme Court is extremely influential in American politics, sometimes even acting as a policy-making body, deciding the fate of such contentious matters as abortion, capital punishment, public expressions of religious belief, and even a presidential election. We will study the Court's rulings in these areas and many others, focusing on the Court's written opinions, the thoughts of those who designed our government, and competing views about the Court's proper role in our system of separated powers.



Pol Sci 483. The US Congress. Studies Congress as a political institution, with an emphasis on the unique natures of the House and the Senate, congressional norms and procedures, and the roles of committees and political parties. Topics include elections, member-constituent relations, national policy roles, leadership, the committee system, legislative procedures, legislative oversight of the executive branch, and the effects of public opinion and interest groups on the law making process.

Pol Sci 484. The American Presidency. Provides an in-depth study of the Presidency with emphasis on the modern era. Examines the policy process and politics of the office, in addition to the powers of the President, presidential administrative structures, styles, roles, and personalities.

Pol Sci 485. Decision Making in Public Policy. Analyzes the formulation and execution of public policy in America. Includes study of decision-making theory, bureaucratic politics, and other models that seek to explain how policy is made. Several domestic issues are explored,

including social, environmental and economic policy issues, as well as weapons acquisition and other defense policy concerns; additional issue areas depend on contemporary significance.

Pol Sci 491. Capstone Seminar in Political Science. This course is the culmination of the political science curriculum. It begins with selections from classic works relevant to today's politics and political science, such as Thucydides, The Federalist Papers, and Tocqueville's Democracy in America. These works synthesize theoretical and empirical study and instruct in the political judgment needed by political scientists, political actors and members of the profession of arms. Also examines recent works on democracy and the many questions about it raised by the subfields of the department's curriculuminternational relations, comparative politics, American politics, and national security. Students will be required to draw upon all the works in the seminar for a final presentation/paper related to a current issue.

Pol Sci 495. Special Topics in Political Science. Selected topics in political science, taught in seminar format. Subject matter varies by semester, depending on faculty expertise and student interest.

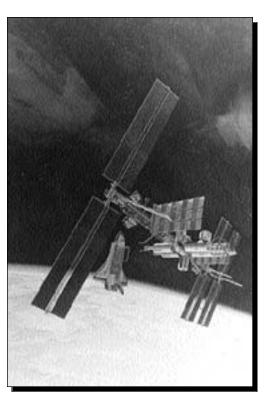
Pol Sci 496. The Politics of National Security Policy. This seminar examines the theory and practices associated with national security policy. The course will include in-dept investigation of contemporary issues in the formulation of national security policy, e.g., budgeting, force planning, alliance relations and national security. Major models and theories of US national security policy making are analyzed so as to prepare students for a major research paper focusing on a significant national security issue.

Pol Sci 498. First-Class Thesis. Cadets enrolled in this course will prepare a thesis under the guidance of faculty members with particular expertise on the topic of research. This course combines the tutorial aspect of an independent study (Pol Sci 499) with seminar on applied research methods. Cadets will meet individually or in seminar in accordance with a schedule determined by the course director. Formulation of thesis and research normally will begin in Pol Sci 300 and other political science courses. When the thesis has been completed, a formal defense will be given to a faculty committee.

Pol Sci 499. Independent Study in Political Science. Individual study or research of a selected topic conducted on a tutorial basis.



Space Operations Major



The Space Operations Major is an interdisciplinary program with primary emphasis on science and engineering. The major is

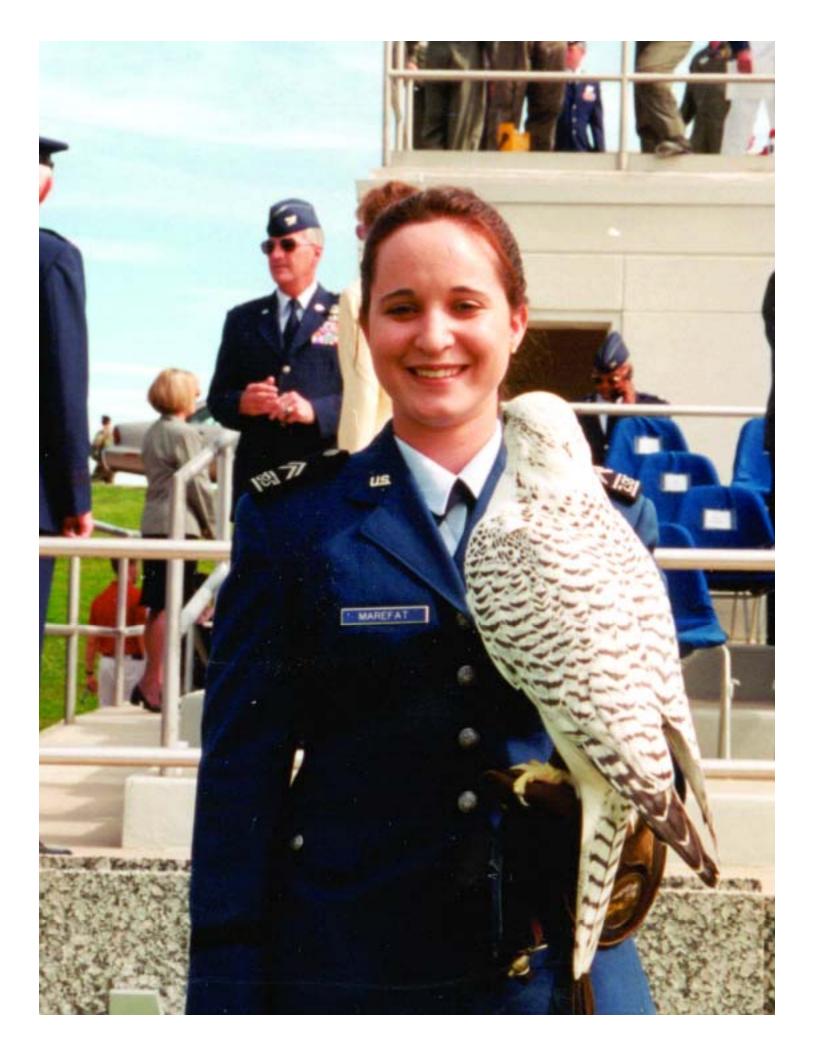
designed to develop Air Force officers with a technical background in space and an understanding of contemporary problems and issues peculiar to space. Course work in science, geography, mathematics, and astronautics provides the technical background required for this field. Coupled with courses in space history, law, policy and military doctrine, this program provides the breadth of education required for this growing field. The Space Operations Major provides the student with excellent preparation for entering a graduate program in space operations.

Space operations is the backbone of Air Force Space Command and is vital to our nation's warfighting capabilities. This program gives you the chance to directly apply what you learn in your major to an Air Force assignment. The Space Operations Major will give you a solid framework for your future Air Force career whether it be in space or as a pilot. In addition, this major serves as an excellent foundation for graduate studies in such fields as space operations, space systems management, space technology, communications, computer systems, remote sensing, operations research, and business administration.

Some Air Force Specialties open to space operations majors include: satellite command and control, spacelift, space warning, missile combat crew, space and missile maintenance, air battle management, communications, and acquisitions.



3rd Class Year	2nd Class Year	1st Class Year
Astro 320	Analytical Methods Option	Academy Option 1
Comp Sci 211	Astro 321	Academy Option 2
El Engr 215	Astro 331	Applied Astro Option 1
English 211	Aero 315	Applied Astro Option 2
Engr Mech 120	Bas Sci Option	Astro 423
For Lang 1	Bio 215	English 411
For Lang 2	Civ Engr 210	Math 356
History 202	Geog 310	MSS 400
Math 243	Law 220	Philos 310
Math 245	Mgt 200	Soc Sci Option/MSS Option
Physics 215	MSS 385	Space Science Option
Soc Sci 112	Pol Sci 311	Space Environment Option





Athletics

Physical Education and Fitness Testing Program

As an integral part of the core curriculum, every cadet is required to take a total of ten physical education courses. The physical education department requires that each cadet take the six required core courses, two core electives and two open electives. The course offerings are divided between six disciplines shown below:

It is important to note that these classes, such as water survival, are not chosen arbitrarily or as a rite of passage. Rather, all of the required core courses were specifically chosen for their value to officer development and their usefulness to a military career. Another facet of the physical education program at the Air Force Academy is the fitness testing program.



Physical Education Curriculum

	Combatives	Developmental	Aquatics	Team	Lifetime	Academic
CORE	Boxing or	Physical	Swimming			
(6)	Wrestling Development (male) Self-Defense (female)		Water Surviv	⁄al		
	Unarmed Combat I					
	Unarmed Combat II					
CORE ELECTIV (2)	VES			Basketball Soccer Softball Volleyball (choose 1 or 2	Golf Racquetball Tennis 2 of both)	
OPEN ELECTIV (2)	/ES		SCUBA	2 nd Team Basketball Soccer Softball Volleyball	2 nd Lifetime Golf Raquetball Tennis	Exercise Physiology Principles of Coaching Sports Management Independent Study*



^{* 42} Lesson, full semester academic elective courses. These courses do not count towards completing the physical education core curriculum.

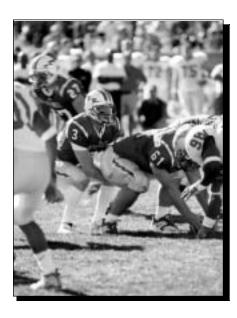
"The greater the obstacle, the more glory in overcoming it."

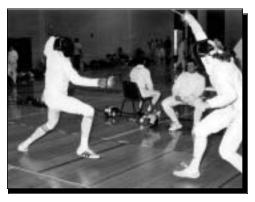
—Moliere, French author/playwright

To fulfill the Physical Education (PE) requirements, every cadet takes a minimum of 1.0 semester hours of PE courses in each of their four academic years. Participation in intramurals, limited on-season mission clubs or intercollegiate athletics is required in each of the eight academic semesters.

Proficiency is also required in both the physical fitness test (PFT) and aerobic fitness test (AFT). Athletic proficiency for graduation is demonstrated by meeting the minimum standard of a 2.00 cumulative physical education average (PEA). PEA is a weighted 4.0 grading scale (50% PFT + 35% PE courses +15% AFT).

You are required to take both the AFT and PFT each semester of your cadet career.





Colonel Spetman graduated from the Air Force Academy in 1976 and served one year as a candidate counselor and junior varsity football coach. He then attended pilot training and upon receiving his wings was assigned to the KC-135A aircraft. Throughout his flying career, he has accumulated over 3,000 flying hours in the T-37, T-38, KC-135A and B-52G/H aircraft including seven combat sorties in the Gulf War. Colonel Spetman's assignments include tours as a KC-135A Standardization and Evaluation Officer, B-1B Project Officer and Congressional Activities specialist, aide-de-camp to the President of the National Defense University, B-52 Instructor Pilot, B-52 Squadron Operations Officer and Squadron Commander. He is a Distinguished Graduate of Squadron Officers School, a top performer from Air Command and Staff College and received a Masters Degree in National Security Strategy from the National War College. Prior to coming to the Academy he was the Chief, Command and Control Division, Operations Directorate, US European Command. Colonel Spetman assumed his duties as Director of Athletics in March 1996.



Colonel Randall W. Spetman Director of Athletics

"Athletic competition tests an individual's ability to operate under stress, against adversity and often with tremendous self-sacrifice. A similar environment often occurs in combat. It is as important today as in anytime in history to ensure the leaders of tomorrow are prepared for diverse situations. The Athletic Department staff is committed to producing the best officers possible for tomorrow's armed forces. Every cadet is challenged physically and mentally to develop the skills and abilities critical to being an aggressive team player with the heart to win."

The tests are scored as follows:

Physical Fitness Test

Event	M	en	Wome	n
	Min	Max	Min	Max
Pull-ups	7	21	1	8
Long Jump	7'0"	8'8"	5'9"	7'2"
Sit-ups	58	95	58	95
Pushups	35	72	18	48
600-Yd Run	2:03	1:35	2:23	1:53

Aerobic Fitness Test

Event	M	en	Women	ı
	Min	Max	Min	Max
1.5 Mile Run	12:25	7:45	14:17	8:55

The fitness testing program serves many purposes including:

- Promoting maximum fitness among the cadet wing.
- Recognizing cadets who excel in maintaining their personal fitness.

Those members of the cadet wing who achieve the maximum point total on either the PFT or AFT belong to the prestigious "500 Club." Those few cadets who maximize their scores on both fitness tests belong to the exclusive "1000 Club."

"Preparedness is the key to success and victory."

— Douglas MacArthur

Intramural Program

"Every cadet is an athlete but not every athlete is a cadet."

 Colonel John J. Clune, USAFA Director of Athletics 1975-1991

In following the service academy tradition that every cadet is an athlete, it is mandatory for all members of the cadet wing to either participate on the intercollegiate level or in the intramural program. The intramural program not only provides cadets with an enjoyable way to exercise, it is one of the best leadership opportunities the Air Force Academy has to offer. With over 3,000 cadets participating each season among 90 contests every afternoon, this cadet-run program generates

nearly 1,000 additional leadership positions each year. These positions include coaching, officiating, and administrative duties. Intramural athletes compete or practice at least twice a week in a variety of sports during each season of competition.

"People acting together as a group can accomplish things which no individual acting alone could ever hope to bring about."

- FDR, 32nd President

The sports offered are:

Fall Intramurals:

Flag Football
Basketball
Soccer
Wallyball
Tennis (Doubles)
Flickerball
Men's Boxing
Mountain Biking

Spring Intramurals:

Volleyball
Racquetball
Softball
Cross Country
Soccer
Rugby
Team Handball
Ultimate Frisbee

The main purpose of the intramural program is to emphasize team before self. The competition is centered on the cadet squadron, with squadron success, not individual accomplishment as the ultimate goal.

"Individual commitment to a group effort—that is what makes a team work, a company work, a society work, a civilization work."

- Vince Lombardi

"I'm a lucky man...I'm no hero...things just worked out. I'd been in situations like that in Falcon Stadium."

> —Captain Scott Thomas, F-16 pilot in Operation Desert Storm and Falcon Football Alumnus

For those who are up to the challenge, the Air Force Academy offers an expansive intercollegiate program. The 30 men's and women's sports sponsored by the Academy include:

Intercollegiate Athletics MEN

Fall	Winter	Spring
Football Cross-country Soccer Water Polo	Basketball Diving Fencing Gymnastics Hockey Indoor Track Rifle Swimming Wrestling	Baseball Golf Lacrosse Outdoor Track Tennis

Intercollegiate Athletics WOMEN

Fall	Winter	Spring
Cross-country Volleyball Soccer	Basketball Diving Fencing Gymnastics Indoor Track Swimming Rifle	Outdoor Track Tennis

"Never give in. Never, never, never, never! Never yield in any way great or small, except to convictions of honor and good sense. Never yield to force and the apparently overwhelming might of the enemy."

- Sir Winston Churchill

The men and women compete in Division I of the NCAA. Most sports are members of the Mountain West Conference comprised of Brigham Young University, Utah, Wyoming, Colorado State University, University of Nevada Las Vegas, Air Force, New Mexico and San Diego State.

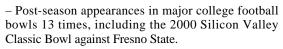


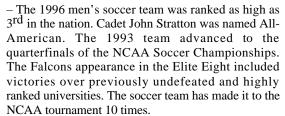
Some recent intercollegiate highlights include:

 2003 Men's and Women's Rugby teams won national championships. Women's team defended their 2002 title -- the Men's team won the title in

1989 and 1990.

- 2000 boxing team wins third consecutive national championship
- Won 15th Commander-in-Chief's trophy
- 2000 Wrestling team had 3 NCAA qualifiers
- 1998 WAC Football Champions, first outright conference championship
- Men's Cross Country placed 2nd at the 1999 MWC Championship
- Women's Cross Country placed
 3rd in the 1999 MWC
 Championship, highest finish ever
- Coach Mark Stanforth was voted the 1999 MWC Cross Country Coach of the Year





- 1995 1st place in the WAC Football Conference with an overall record of 8 - 5.
- 1995 and 1996 Women's Swimming Division II National Champions.
- 1995 Women's Cross country 6th place NCAA Championships, including two All-Americans.
- 1995 Women's Soccer Team finished 11th in the nation, the team's highest national ranking ever.
 Senior Tracy Healy became the team's first-ever All-American. Cadet Healy was also named the Colorado Athletic Conference Player of the year.
- 1991, 1994, and 1996 WAC Men's Cross-country titles.
- 1994 Western Water Polo Association Conference Champions. In 1995, four members of the water polo team were selected to participate in the U.S. Olympic Festival
- Additionally, many Air Force teams have achieved



national ranking including: Women's and Men's Cross-Country, Men's and Women's Fencing,



Men's and Women's Gymnastics, Rifle, Men's Soccer, Women's Swimming, Women's Tennis, and Water Polo. Individually, 339 cadetathletes have achieved All-American (athletic) rankings.

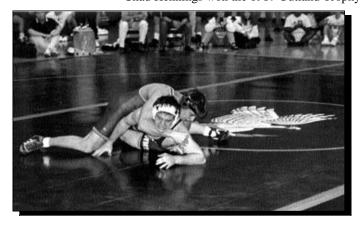
The academic standards for the intercollegiate athletes are no different than for those of the remainder of the cadet wing. In fact, many intercollegiate athletes excel in class as well as

on the field. The Academy has produced:

- —51 NCAA Postgraduate Scholarships.
- —12 National Football Foundation Scholar-Athletes.
- -92 Academic All-Americans.
- —354 Athletic All-Americans.
- 9 of 31 Rhodes Scholars have been varsity athletes.
- —75 National Champions.

In addition to their academic achievement several Academy athletes have received national attention for athletic achievement:

- Beau Morgan earned All-American honors in 1996. He is the only quarterback in NCAA history to rush and pass for over a thousand yards in two different seasons.
- Chris Gizzi earned All-American honors in 1997. He was among the national leaders in tackles as a linebacker.
- In 1998, Connie Cann became the first female swimmer in Academy history to compete in the NCAA Division I swimming championships. She swam in the 100 butterfly.
- —Alonzo Babers won two Gold medals in Track in the 1984 Olympic Games.
- -Chad Hennings won the 1987 Outland Trophy



for being the most outstanding collegiate football lineman in the nation (he has completed his military service and now plays professional football).

- —Dee Dowis, as an Academy football quarterback, was a finalist for the 1989 Heisman Trophy.
- —Academy cornerback Carlton McDonald was a unanimous All-American in 1992 as he was named to the first-team of every major All-American team. Cadet McDonald led the nation in interceptions that season and was a finalist for the Jim Thorpe Award, awarded annually to the nation's top defensive back.
- —Academy punter Chris MacInnis was a firstteam United Press International All-American in 1993. Cadet MacInnis won the AT&T Long Distance Award as he led the nation in punting average.
- —Karen Burton (Class of 1984), 16-time All American in swimming, was a member of the 1990 US Relay Team. The team swam across the English Channel breaking the old record of 7 hours, 17 minutes.
- —Brian Pendergast won a silver medal as a starter for the 1994 US Olympic Festival Water Polo Team. Cadet Pendergast started for the US Junior World Championship Team that played in France.
- —Four water polo players, Brad Downs, John Christ, Mackie Contreras, and Craig Thomas earned silver medals at the 1995 US Olympic Festival.
- —Cross-country/track star Eric Mack won the 5,000 meter race in the 1995 US Olympic Festival. Cadet Mack finished 3rd at the NCAA Division I Cross-country Championship as the top American.

If you desire to be a part of the athletic tradition at the Air Force Academy, write to the coach of your sport at:

> HQ USAFA/AH 2169 Field House Drive, Suite 111 USAF Academy, Colorado 80840-9500

"On the fields of friendly strife are sown the seeds that on other fields on other days bear the fruits of victory."

— General Douglas MacArthur

Facilities

The athletic facilities at the Air Force Academy are some of the finest in the nation. The athletic complex includes the Cadet Gym, the Cadet Field House, and numerous outdoor playing fields.

The five-level Cadet Gymnasium is the standard by which other collegiate athletic complexes are judged. Among the facilities found within the Gym are:

- three basketball gyms which contain 10 practice and three regulation size courts,
- four indoor tennis courts with indirect lighting and permanent seating for 380 spectators,
- an Olympic-size swimming pool with one and three meter boards with five and 10 meter platforms and permanent seating for 1,200 spectators,
- a water polo pool measuring 60 feet by 125 feet by seven feet deep,
- three squash and 19 racquetball/handball courts, and
- two weight training rooms, each 10,000 square feet or more with state of the art equipment. One training room contains a 30-yard astroturf track.

The Cadet Field House, located across the street from the Gymnasium, is equally impressive with:

- a six-laps to a mile, six-lane Tartan surface indoor track with seating for 925 spectators,
- an astroturf playing field used for inclement weather football, lacrosse, soccer, and baseball practice,
- an ice hockey arena with seating for 2,502 spectators, and
- a 6,002-seat basketball arena, dedicated the Clune Arena on December 6, 1993, in honor of past Athletic Director, Colonel John J. Clune.

A superb sports medicine department within the Gymnasium and Field House complex includes:

- two training rooms; a 3,325-square foot area in the Gym and a 2,309-square foot area in the Field House, and
- a Human Performance Laboratory complete with hydrostatic weighing equipment, sports psychology and vision testing capabilities, and aerobic testing equipment.

Sports medicine programs include:

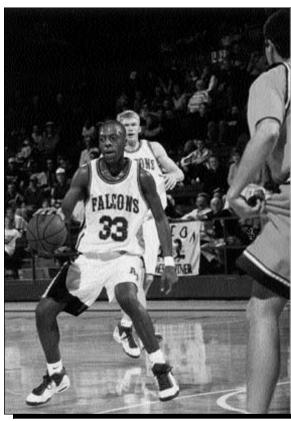
- rehabilitation and health maintenance to all cadets,
- singular programs for each individual,
- individual counseling, team building, and sports specific programs,

- sports vision and imagery routines and stress management and relaxation techniques, and
- sport specific training, plyometrics, and weight gain and loss counseling.

The outdoor playing fields and facilities are a fine complement to the Gym and Field House with:

- the 54,156-seat Falcon Stadium, home to the Air Force football team,
- the Eisenhower Golf Course which includes two championship par 72, 18-hole courses,
- a soccer stadium which seats 800,
- an intercollegiate baseball diamond with astroturf infield,
- 33 tennis courts and six basketball courts,
- a track and field facility complete with a 400-meter Tartan surface track, and
- 153 acres of practice and intramural fields including 16 football fields (one astroturf and two under lights), 12 rugby fields, and 12 soccer fields.

Overall, the athletic facilities at the Air Force Academy are as fine as any school—anywhere. As a cadet at the Academy your opportunities to better yourself physically are never limited by resources, but only by your will.



Director of Athletics

Col Randall W. Spetman – MS, Central Michigan University

Vice Athletic Director

Mr. Bradley J. DeAustin – JD, University of Missouri

Senior Women's Administrator

Ms. Martha J. Gasser - MEd, University of Cincinnati

Permanent Professor and Head, Department of Physical Education

Col William P. Walker – EdD, University of Northern Colorado

Deputy Director of Athletic Programs

Mr. Jeffrey N. Heidmous – MA, University of California, Santa Barbara

Director of Sports Medicine

Col Danny L. Holt – MS, University of North Carolina

Director of Operations Support

Ms. Emily Chamberlin – MEd, University of North Carolina

Executive Officer, Department of Athletics

Capt Mark Hille - MBA, University of Colorado

Associate Athletic Director for Finance

Mr. Mike Saks – BS, United States Air Force Academy

Associate Athletic Director for Marketing and Development

Mr. Alan McKellar – BS, Lake Superior State

Assistant Director of Athletics for Candidate Counseling

Mr. James N. Bowman – BA, University of Michigan

Chief, Events Management

Mr. Joe Novak – MEd, Temple University

Director of Sports Information

Mr. Troy Garnhart – BA, University of Southern Colorado

Chief, NCAA Compliance Division

Lt Col Linda Huggler – MS, Air Force Institute of Technology

Director of Facility Support

Lt Col Roger D. Gustafson – MA, Central Michigan University

Chief, Physical Education Division

Lt Col Douglas Hill – MA, University of Northern Colorado

Chief, Scheduling and Grading Division

Lt Col Ivan Merritt – MA, University of North Carolina

Chief, Instructor Development Division

Lt Col Douglas Wells – EdD, University of Northern Colorado

Chief, Fitness Testing and Evaluation Division

Maj Lawrence Friend – MA, University of Northern Colorado

Assistant Athletic Director of Intercollegiate Liaison

Lt Col George Nelson Jr. – MBA, Troy State University

Chief, Intercollegiate Support Division

Maj Lynn Page – MS, Embry-Riddle Aeronautical University

Chief, Intramural Division

LTC (USA) John Bianchi – BA, University of Rhode Island

Instructors

- Lt Col Alan Arata PhD, University of Oregon, Eugene
- LTC (USA) John Bianchi BA, University of Rhode Island
- Lt Col Roger Gustafson MA, Central Michigan University
- Lt Col Doug Hill MA, University of Northern Colorado
- Lt Col Linda Huggler MS, Air Force Institute of Technology
- Lt Col Ivan Merritt MA, University of North Carolina
- Lt Col George Nelson MS, Troy State University
- Lt Col Douglas Wells EdD, University of Northern Colorado
- Lt Col Michael Zupan PhD, University of Utah Maj Lawrence Friend – MA, University of Northern Colorado
- Maj Jon Jordan MA, Chapman University Maj (USA) Rob Koehler, MS Indiana University Maj Lynn Page – MS, Embry-Riddle Aeronautical University
- LtCdr (USN) Jeff Rad MS, Naval War College Capt Jim Binns – MSM, Troy State University Capt Floyd Brazier – BS, United States Air Force Academy
- Capt Justin Broughton BS, United States Air Force Academy
- Capt Jamie Burgener BS, United States Air Force Academy
- Capt Mark Clifford MS, University of Maryland Capt Adam Edwards – BS, United States Air Force Academy

Capt Erika Schenavar – MA, University of Oklahoma

Capt Sierra Suhajda – MS, Air Force Institute of Technology

Capt Karla Rudert - MS, University of Idaho

Dr. Abdelmonem H. Salem – MD, University of Alexandria

Mr. Fred Acee - MS, Ithaca College

Mr. Bobby Applegate – BS, Southern Colorado

Mr. Wayne Baughman – MA, University of Colorado

Mr. Marty Buckley - MA, St Mary's College

Mr. Louis A. Burkel III – MA, University of Northern Colorado

Mr. Robert Clayton - BS, University of Wyoming

Mr. Keith C. Converse – BEd, Washburn University

Mr. Stan Curnow – MA, Brigham Young University

Mr. Jeff Ehrlich – BS, California State University, Long Beach

Mr. Allen Hedrick – MA, California State University, Fresno

Ms. Jeanie Geurin - MS, University of Colorado

Ms. Kim Gidley – MS, University of West Virginia

Mr. Richard Gugat – MA, University of Denver

Mr. George Koury - MBA, St Mary's University

Mr. Ralph Lindeman – MS, Arizona State University

Mr. Sam Martin – MA, Ft Leavenworth, Kansas

Mr. Pete Melanson – MS, University of Tennessee

Mr. Reed Peters – BS, University of Nevada, Las Vegas

Mr. Eric Seremet – BA, University of North Carolina

Mr. Mark Stanforth - MS, Northern State College

Mr. Luis Sagastume – MA, California State University, Chico

Ms. Holly Tedechi – BS, Radford University

Mr. Eddie Weichers – MS, University of Denver

Mr. Al Wile – MS, Chapman College

Lisa Woody - PhD, Texas Woman's University

Men's Intercollegiate Athletics

Football Head Coach

Mr. Fisher DeBerry – MEd, Wofford College **Assistant Coaches**

Lt Col Jeffrey Hays – MA, University of Texas Capt Alex Kleckner – BS, United States Air Force Academy

Mr. Richard Bell - MS, University of Arkansas

Mr. Dean Campbell – BA, University of Texas

Mr. Richard Enga – MS, Troy State University

Mr. Allen Hedrick – MA, California State University, Fresno

Mr. Tim Horton – BA, University of Arkansas

Mr. Thomas Miller – MS, University of Bridgeport

Mr. Jerome Oliver – BS, Purdue University

Mr. Chuck Peterson – BS, United States Air Force Academy

Mr. Vic Shealy – Med, Baylor University

Mr. Ed Warinner - MA, Akron University

Basketball Head Coach

Mr. Joe Scott – LLM, University of Notre Dame School of Law

Assistant Coaches

Maj Jon Jordan – MA, Chapman University Mr. Larry Mangino – Med, George Washington University

Mr Mike McKee – BA, Lehigh University Mr. Chris Mooney – BA, Princeton University

Ice Hockey Head Coach

Mr. Frank Serratore – MS, North Dakota

Assistant Coach

Mr. David Schooley - BS, Western Michigan

Baseball Head Coach

Mr. Reed Peters – BS, University of Nevada, Las Vegas

Assistant Coaches

Capt Michael Manor – BS, United States Air Force Academy

Boxing Head Coach

Mr. Eddie Weichers – MS University of Denver Assistant Coach

Capt. Mark Clifford – MS, University of Maryland

Cross Country Head Coach

Mr. Mark Stanforth – MS, Northern State College
Assistant Coach

Capt Sierra Suhajda – MS, Air Force Institute of Technology

Cheerleading Coach

Vacant

Fencing Head Coach

Dr. Abdelmonem H. Salem – MD, University of Alexandria

Assistant Coach

Capt Zackaria Becker - MS, Troy State University

Golf Head Coach

Mr. George Koury – MBA, St Mary's University

Gymnastics Head Coach

Mr. Louis A. Burkel III – MEd, University of Northern Colorado

Indoor and Outdoor Track and Field Head Coach

Mr. Ralph Lindeman – MS, Arizona State University Assistant Coaches

Capt Floyd Brazier – BS, United States Air Force Academy

Capt Sierra Suhajda – MS, Air Force Institute of Technology

Mr. D. Scott Irving - MA, Northwestern

Lacrosse Head Coach

Mr. Fred Acee - MA, Adelphi University

Assistant Coach

Maj (USA) Rob Koehler – MS, Indiana University Mr. Eric Seremet – BA, University of North Carolina

Rifle Head Coach

Capt Justin Broughton – BS, United States Air Force Academy

Soccer Head Coach

Mr. Luis A. Sagastume – MA, California State University, Chico

Assistant Coaches

Lt Col Douglas Hill – MA, University of Southern Colorado

Swimming Head Coach

Mr. Robert Clayton, - BS, University of Wyoming

Diving Head Coach

Mr. Stan Curnow - MA, Brigham Young University

Tennis Head Coach

Mr. Richard F. Gugat – MA, University of Denver Assistant Coach

Capt Jerry Ledzinski – BS, United States Air Force Academy

Water Polo Head Coach

Mr. Jeff Ehrlich – BS, California State University, Long Beach

Assistant Coach

Capt. Brian Pendergast – BS, United States Air Force Academy

Wrestling Head Coach

Mr. Wayne Baughman – MA, University of Colorado Assistant Coaches

Lt Col Douglas Wells – EdD, University of Northern Colorado

Women's Intercollegiate Athletics

Basketball Head Coach

Ms. Ardie McInelly – MA, Weber State University Assistant Coaches

Capt Karla Rudert – MS, University of Idaho Ms. Angela Munger – BA, Idaho State University Ms. Steph Spencer – BA, Montana State University Ms. Holly Togiai – BA, Idaho State University

Indoor and Outdoor Track and Field Head Coach

Mr. Ralph Lindeman – MS, Arizona State University Assistant Coaches

Capt Floyd Brazier – BS, United States Air Force Academy

Capt Sierra Suhajda – MS, Air Force Institute of Technology

Mr. D. Scott Irving - MA, Northwestern

Cross Country Head Coach

Mr. Mark Stanforth – MS, Northern State College Assistant Coach

Capt Sierra Suhajda – MS, Air Force Institute of Technology

Fencing Head Coach

Dr. Abdelmonem H. Salem – MD, University of Alexandria

Gymnastics Head Coach

Mr. Louis A. Burkel, III – MEd, University of Northern Colorado

Women's Coaching Staff

Ms. Holly Tedeschi – BS, Radford University Ms. Lisa Woody – PhD, Texas Woman's University

Soccer Head Coach

Mr. Marty Buckley – MA, St Mary's College **Assistant Coach**

Capt Jamie Burgener – BS, United States Air Force Academy

Swimming Head Coach

Mr. Casey Converse – BEd, Washburn University
Assistant Coach

Capt Erika Schenavar – BS, United States Air Force Academy

Diving Head Coach

Mr. Stan Curnow - MA, Brigham Young University

Tennis Head Coach

Ms. Kim Gidley - MS, University of West Virginia

Volleyball Head Coach

Ms. Penny Lucas-White – BS, University of Memphis Assistant Coach

Maj Scott Nelson – MBA, Chaminade University
Ms. Verna Julaton – BA, Metropolitan State
University

PHYSICAL EDUCATION (Phy Ed)

Offered by the Department of Physical Education under the Director of Athletics.

Phy Ed 100. Basic Physical Training. Preparation for strenuous physical education and athletics by development of physical strength, endurance, agility, and coordination through conditioning exercises, sports competition, and taking the physical fitness and aerobics tests. Special training in conditioning as needed.

Fourth-Class Phy Ed. Graded instruction in wrestling or boxing (males) or self-defense (females), and physical development or onseason intercollegiate athletics. Participate in intramurals, limited on-season clubs, or intercollegiate athletics and take the physical fitness and aerobics tests unless excused. Remedial instruction in physical fitness, and aerobics for designated cadets. A graded or nongraded elective sub-course may be taken as a fourth course.

Third-Class Phy Ed. Graded instruction in swimming, water survival, and a lifetime core elective or on-season intercollegiate athletics. Participate in intramurals, limited on-season clubs, or intercollegiate athletics, and take the physical fitness and aerobics tests unless excused. Remedial instruction in swimming, physical fitness, and aerobics for designated cadets. A graded or non-graded elective subcourse may be taken as a fourth course.

Second-Class Phy Ed. Graded instruction in Unarmed Combat I and II, and a lifetime core elective, or on-season intercollegiate athletics. Participate in intramurals, limited on-season clubs, or intercollegiate athletics and take the physical fitness and aerobics tests, unless excused. Remedial instruction in physical fitness and aerobics for designated cadets. A graded or non-graded elective sub-course may be taken as a fourth course.

First-Class Phy Ed. Graded instruction in two open electives and on-season intercollegiate athletics. Participate in intramurals, limited onseason clubs, or intercollegiate athletics and take the physical fitness and aerobics tests. Remedial instruction in physical fitness and aerobics for designated cadets. A graded elective sub-course may be taken as a fourth course.

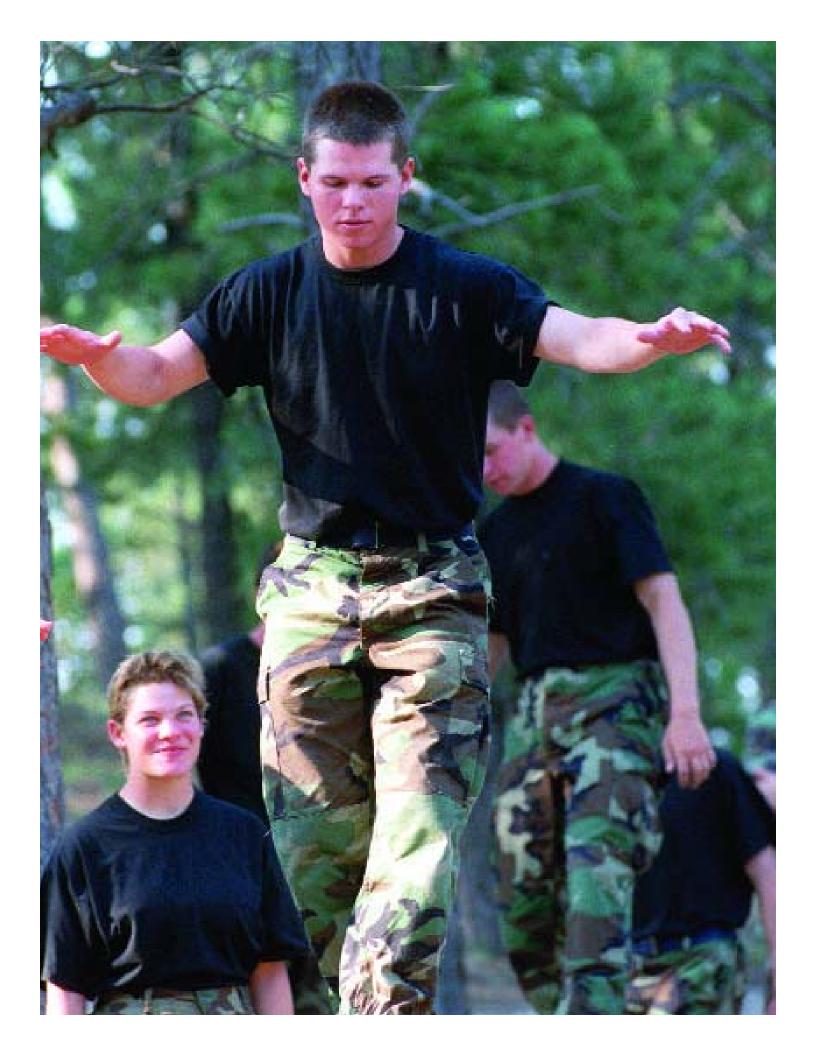
Phy Ed 440. Exercise Physiology. The study of how the body, from a functional standpoint, responds, adjusts, and adapts to exercise. This includes acute exercise, i.e., single bouts of exercise, as well as prolonged exercise, as in the case with athletic training programs. Course consists of both classroom and laboratory sessions.

Phy Ed 460. Science of Sports Management. In-depth look at sports management. Course focuses on the organizational concerns in collegiate athletic coaching and administration. Basic principles, applicable to all sports, are explored. Emphasis on philosophy, sports psychology, physiology, and physical principals of motion.

Phy Ed 499. Independent Study. Individual research and study in the physical education field under the direction of a faculty member. Emphasizes the use of laboratory facilities.







Academy Experience

Cadet Life

No matter what your background, the cadet lifestyle is probably different from any in your experience. Individual dedication, sacrifice, and stamina are vital to meet the mental, ethical, and physical demands of daily living. You must organize your time and establish self-discipline. The Academy's military environment requires structure, rules, and instructions to train you as a professional Air Force officer and leader.

Cadet Schedule

You'll have four 50-minute periods each morning and three each afternoon. Breakfast and lunch are mandatory formations and after classes you'll join in mandatory athletic activities.

Unless you're an intercollegiate athlete, you'll play on an intramural team two afternoons a week after classes. The other three afternoons you have squadron activities or discretionary time. Intercollegiate athletes usually practice or compete every afternoon and frequently on weekends, too.

Many cadets take additional academic instruction after classes or during other unscheduled times. You'll also spend many evenings studying in your room or in the library. You must be in your room and in bed at taps, (the last bugle call before lights out), unless you have special permission to study late. You'll frequently attend parades and inspections and study on Saturday mornings, but you're usually free Saturday afternoons and Sundays.

Your fall and spring semesters last 17 weeks each, and the summer term lasts 10 weeks. Instead of a three-month summer break, you'll have three weeks. During the summer term, you'll repeat academic classes if necessary, or you may participate in one of various leadership and military training programs, depending on your class year. Many assignments include travel to Air Force bases, some of which are overseas. Some cadets stay at the Academy for summer flight training or to help train other cadets. Each year the new class enters in late June and begins an intense period of military training called Basic Cadet Training (BCT).



Leaves and Passes

You'll have limited time away from the Academy during your first year. During the first five weeks, while you're in BCT, you may not have visitors, or receive phone calls. After Parent's Weekend, the restrictions relax somewhat. During your fourth-class year you may receive phone calls and have visitors on Saturday afternoons and evenings, as well as on Sunday mornings and afternoons. You may entertain friends at "Arnie's," the Academy's cadet lounge, watch movies and TV, or order pizzas and ice cream. You may also invite friends to attend balls, concerts, and other live entertainment at the Academy. The athletic schedule provides many activities to enjoy with your friends. Your activity fee covers the cost of most events for you, and usually you may buy discount tickets for your friends.

After your first year, when you become an upper-class cadet, your privileges gradually increase. As a third-class cadet, you'll have limited chances to go into the local area; you'll have more during your second-class year, and as a first-class cadet, you must still attend scheduled military duties such as parades, training, inspections, and football games.

When you're on a Friday or Saturday pass, you must return to the dormitory by 1:30 a.m. When you have a weekend pass, you may leave from the Academy following your last military duty Friday or Saturday and stay until Sunday at 7:00 p.m. Individual achievement or deficiency determines the number of passes you receive. Unsatisfactory performance in military training, academic studies, or athletics restricts your free time; above average work increases your free time.



Most cadets go to Colorado Springs during offduty time. You may not own or maintain an automobile as a fourth- or third-class cadet, but you may rent one while on an authorized pass or privilege. Eligible second- and first-class cadets may own cars and keep them at the Academy.

In most instances, you'll receive three weeks of summer leave (except during the summer you enter), approximately two weeks of Christmas leave, and one week during the spring. You may receive emergency leave if an emergency involves a member of your immediate family. Other requests for special leave are considered individually.

Recreation

Opportunities abound when you can relax briefly away from the demanding schedules, discipline, and restrictions of cadet life.

You may check out ski equipment and other recreation accessories from Cadet Recreation Supply in Vandenberg Hall for weekend outings. The Cadet ITT Office in Vandenberg Hall can help you book lodging and car rentals so you can get to the nearby ski areas. Transportation is also available from the Academy to airports in Denver and Colorado Springs during Thanksgiving, Christmas, and spring breaks.

The Cadet Recreation Lodge plus Lawrence Paul Pavilion, located just west of the cadet area, is available for squadron parties and picnics. Enjoy a fishing trip or picnic with friends at nearby Farish Memorial recreational area. Journey to a nearby resort area for fabulous skiing. Go on a weekend jaunt of sight-seeing. Or just hike the hills and enjoy the scenery.

Even if you can't get away, Arnold Hall is near enough so you can relax in the informal lounges and recreational areas. Arnie's cafeteria, game rooms, a disco, sports bar, nightly movie showings and live entertainment in the theater and lounges offer you chances to unwind, visit with friends, and share the good times. In the cadet sports areas you can hone your golf or tennis game, play touch football, jog, and swim.

You'll quickly learn that recreation possibilities on and off the Academy are limited only by the time you have to participate.

Cadet First Class Kathleen A. Dildy, the daughter of Don and Terry Dildy, grew up in Houston, Texas. She was captain of the volleyball team and Vice President of the National Honor Society at Cypress Creek High School, as well as a recipient of the Presidential Youth Service Award. Cadet Dildy has served as a captain on the USAFA Volleyball team, the Vice-Chairperson for the Mountain West Conference Student-Athlete Advisory Committee, and the president for the Fellowship of Christian Athletes. Cadet Dildy is a Behavioral Sciences and Leadership major. Appointed Cadet Wing Commander in August 2003, she is responsible for the good order and discipline of the 4,000 cadets at the Academy.



Kathleen A. Dildy Cadet Wing Commander, Fall 2003

"We are the members of the United States Air Force Academy Cadet Wing. United as one team, we persevere with passion to uphold the honor and tradition of the Academy, to live the legacy of those who came before us, and to establish our own legacy in these changing times. We embrace the opportunities as well as the obstacles we encounter with a warrior spirit founded on the pride and faith we have in this unparalleled institution. With a desire to serve our nation as leaders of character, we are committed to the values of integrity, service before self, and excellence in all we do. We are the United States Air Force Academy Cadet Wing, and we are dedicated to the development of the world's finest officers."

Extracurricular Activities, Cadet Clubs and Sponsorship

Voluntary cadet clubs and activities are available to develop your talents and interests outside the curriculum. Currently, there are 100 extracurricular clubs and teams at the Academy. These clubs are run by cadets, for cadets, with oversight by officers and staff. While some of these clubs offer recreational releases, they all offer cadets the chance to engage in various competitive, professional and humanitarian projects.

Many clubs represent the Academy in local, national and international competitions. Other clubs involve cadets in worthwhile community service projects.

Mission Activities

Drum and Bugle Corps

Falconry

First Responders Team

Flying

Forensics

Honor Guard

Media (Yearbook and Video productions)

Sabre Drill

Soaring (Cross-Country and Aerobatic Teams)

Wings of Blue Parachute

Mission Clubs

Choirs (Catholic, Gospel, Jewish, Latter Day Saints, Protestant, Protestant Praise Team)

Chorale

RATTEX (Entertainment Technician)



Professional Clubs

AIAA (American Institute of Aeronautics and Astronautics)

AISES (American Indian Science and

Engineering Society)

Astronomy and Physics

Biology (Tri Beta Honor Society)

Chemistry

Civil Engineering

Forum

French

Geoscience

History

IEEE (Institute of Electrical and Electronic

Engineers)

International Club

Mechanics

Mock Trial

National Space Society, Student Chapter

Omega Rho Honor Society

Psychology

Russian

Sigma Gamma Tai (Aero Engineering Honor

Society)

Spanish Club

Tau Beta Phi (Engineering Honor Society)

Competitive Teams

Cycling/Mountain Biking

Fastpitch, Women's

Handball, Men's Team

Lacrosse, Women's

Rugby (Men's and Women's)

Ski Racing (Alpine and Nordic)

Volleyball, Men's

Recreational Clubs

Academy Concerts

Aikido

Amateur Radio

Archery

Arnold Air Society

Aviation

Big Brother/Big Sister

Bluebards (Dramatics)

Bowling

Car

Caving/Grotto

Chamber Music

Chess

Darts, Foosball and Pool

Explorers/Scouting

Equestrian

Fitness/Powerlifting

Fly Fishing

Handball, Individual

Hunting

Ice Hockey

Judo

Karate

Karate, Traditional

Kayaking

Los Padrinos (Hispanic)

Marathon

Model Engineering

Mountaineering

Ninjutsu

Pacific Rim

Paintball

Pistol/Combat

Pistol/Collegiate

Prior Enlisted Council

Racquetball

Rodeo

Rowing

Sailing
Scuba
Show Choir (Singing/Dancing)
Ski Club
Soccer (coed)
Softball, Men's
Squash
Table Tennis
Trap and Skeet
Triathalon
Tuskegee Airmen
Ultimate Frisbee
Wargaming
Waterpolo, Women's
Way of Life (African American)

Community service is an integral part of life at the Air Force Academy. Volunteer community service allows cadets to become involved with the local community. By volunteering, cadets come to understand the Academy's core value of "service before self." Through community service, you will learn to empathize and show respect to and for others; two critical ingredients in the professional military character.

Sponsorship

The sponsorship program matches fourth-class cadets with a "Sponsor Family" in the local area. Sponsors provide a home away from home for cadets and many keep in touch long after they have graduated from the Academy.

Counseling and Advising

Many sources provide counseling to help you adjust to your new life style and develop as a professional officer. You may visit them whether you simply want someone to talk to or need more complete guidance.

Air Officers Commanding (AOC) are responsible for the morale, welfare, motivation, training, and discipline of the cadets in their squadrons. They continually review your progress and are the primary points of contact between your parents and the Academy.

Military Training Leaders (MTL) complement the AOC in providing daily support to all cadets.

Squadron faculty officers counsel you in academic areas and help you with problems of academic deficiency or probation. Instructors help you in academic course work, as well as in selecting major academic fields and developing officer skills.

Counselors help you gain the most satisfaction from cadet life and attain the highest degree of academic success in your courses. People in Curriculum and Scheduling Services advise you on course selection and scheduling, academic majors, and postgraduate scholarship opportunities.

People in the Cadet Personnel Office help you select your initial Air Force career field. They also advise you of personnel programs and policies which may affect your career goals.

First-class cadets, serving as cadet officers, play a major role in guiding you. They provide much of the training and athletic supervision within each squadron and help in tutoring. Members of the Way of Life Committee and Los Padrinos Club also offer support.

A Jewish rabbi, Catholic priests, and Protestant ministers offer counseling in personal, moral, and spiritual matters. The Mental Health Clinic, under the Command Surgeon, offers complete psychiatric service.

Religious Activities

The Academy's spiritual aspect, present in all facets of cadet life, provides an extra dimension to traditional learning.

The Cadet Chapel, the center of religious activities for the cadet wing, contains Protestant, Catholic, and Jewish worship areas, as well as an all-faith worship room. Chaplains provide all cadets daily opportunities for worship and regularly visit cadet training areas.

Many cadets attend optional service, taking advantage of the chance to grow spiritually. They participate regularly, share worship leadership and planning, and serve in various ways. You may participate in a broad range of activities related to spiritual and moral growth including Sunday or Sabbath worship activities, daily morning and evening services, special

denominational services and activities, cadet choirs, Bible classes, religious discussion groups, values-education classes, and weekend retreats. Air Force chaplains—ordained clergymen—conduct—the religious services. You may attend church and teach Sunday school classes in local religious education programs





when not on duty and participate in one or more cadet fellowship organizations.

Thousands from the local area join the cadets for the Christmas "Messiah" and "A Festival of Lessons and Carols" programs. During Lent, many come to see the dramatic "Living Portrayal of the Last Supper." Organ recitals, guest artists, and special concerts complement the busy regular schedule. Graduation Week, with Baccalaureate services and a long parade of weddings, brings each academic year to a close.

Legal Service

The Academy's professional legal staff may provide you confidential advice, and help you prepare legal documents, or advise you on legal problems, but they can't represent you in a civilian court.

Cadet Benefits

You'll receive full tuition, room and board, medical care, and monthly pay. The pay covers the cost of uniforms, books, and supplies, with a modest amount left for personal spending and a savings account. You'll purchase officer uniforms and meet other initial expenses with these savings when you graduate. You may receive an interest-free loan to cover an emergency situation if necessary.

You may participate in a government-sponsored life insurance program, Servicemen's Group Life Insurance (SGLI), which provides term life insurance from \$10,000 to \$250,000 in \$10,000 increments. You may deduct the fee from your monthly pay, and carry the policy forward after graduation.

Medical Care

You'll receive outpatient treatment, physical examinations, and routine dental examinations in the cadet clinic located in the Consolidated Education and Training Facility (CETF). For emergency dental care after duty hours, you'll go to the nearby Academy hospital. If you must be hospitalized, you usually may continue academic studies. If medically able, you'll receive instruction either at your bedside or in a hospital classroom.

You may not refuse necessary medical treatment because of religious or personal beliefs.

Cadet Uniforms

You'll wear various uniforms depending upon the occasion and the weather. Men wear a blue shirt and trousers during the academic year. Women wear a blue blouse with a skirt or slacks. You'll be able to wear a jacket in cool weather and a parka in cold weather. For dress occasions, you'll wear a blue uniform, with a skirt or slacks matching the jacket for women and trousers for men. Other uniforms are the mess dress for formal or social functions, parade dress for formal ceremonies, battle dress uniform for field training, flight suits for flying activities, and athletic uniforms.

First-, second-, and third-class cadets may wear civilian clothes when on leave and weekend privileges. Fourth-class cadets are not permitted to wear civilian clothing until approved by the Commandant.

Graduation Week

Graduation completes an extremely challenging program. After testing your character, as well as your intellectual, physical, and leadership abilities, you're ready to serve your country.

During the week before graduation, the Academy honors your class with parades, socials, and other events. The week has special significance for members of all classes as they look forward to new opportunities in the coming year.



Several award ceremonies highlight the week by recognizing individual cadets and cadet units which have achieved scholastic, military, and athletic honors. Baccalaureate exercises, the graduation parade, and finally, the graduation exercises wrap up Graduation Week and your years at the Academy. Proud families and friends share the excitement and sense of accomplishment with you. You'll hear a distinguished guest speaker, receive your bachelor of science degree, and take the oath of office for your commission in the Air Force. The years you spent, which sometimes seemed long and difficult, may already seem short and memorable.

The Academy's military training, academics, athletics, and chances to develop character prepare you to be a professional officer who can lead tomorrow's Air Force.

Careers

As the 21st century opens, a challenging career faces the Air Force officer. Technological advances, increased demands for innovative resource management, and the continuing pledge to guard and defend our national goals—these are the challenges you will face.

Your assignment following graduation will relate directly to your Academy training and the needs

of the Air Force. If not selected for pilot or navigator training and subsequent assignment to a flying career, you'll enter one of several nonflying career fields. No matter what field you enter, you'll be an Air Force officer!

Discover the Opportunities

You can do nothing of real or lasting value without dedication. That's why we seek men and women who are devoted to their country and to serving in the United States Air Force.

Your Future in the Air Force

Over half of Academy graduates may be selected for flying training. Others serve in one of four non-flying categories. Officers who serve as doctors and legal officers are not on this list because their assignments depend on academic qualifications they complete only after graduation from the Academy. But, some graduates do serve in these specialties.



Every Air Force assignment involves hard work and increasing responsibilities. Yet, each assignment offers many personal and professional rewards. Your special skills and talents will match an Air Force officer career field.

We'll summarize the four main categories and sample the specialties that cover most non-flying Air Force officers. This sampling will give you an idea of your career possibilities as an Air Force officer. Later, as you near graduation from the Academy, qualified experts will be available to explain each specialty in detail and match your academic majors, talents and desires with Air Force needs.

Category/Specialty	Officers	% of Non-Flying
Operations:		18%
Air Traffic Controller	1%	芒圆线 1.4
Air Weapons Controller	4%	PRESE 48
Missile Launch Officer	5%	190000011: 150
Operations Management	4%	38 18 19
Space Operations	4%	Name of
Scientific/Technical:		38%
Weather	2%	
Scientific	3%	10000
Civil Engineering	5%	STATE OF STA
Development Engineering	10%	M. L. 2018 J. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
Acquisition Management	5%	
Communications/Computers	13%	ALEBONIO TO
Sortie Generation/Logistics:	100	20%
Missile Maintenance	1%	
Aircraft Maintenance	6%	
Logistics Plans/Programs	2%	1939 hadila
Supply	2%	
Transportation	2%	
Intelligence	7%	
		24%
Mission Support:	20/	2470
Contracting Financial	3% 3%	AND DESCRIPTIONS
	2,0	Section 1
Personnel	3% 2%	
Security Police		
Services Information Management	1%	
Information Management	4%	
Manpower	1%	
Public Affairs	1%	3
Special Investigations	1%	100
Health Services Administration		
Biomedical Services	1%	
Other	3%	

Operations

Air Traffic Controller

Officers in air traffic control oversee aircraft takeoffs and landings by supervising centers covering radar approach, air route traffic, ground control approach, and air base towers.

You'll oversee air traffic flying operations and systems; you'll serve as a staff officer on matters concerning air traffic control; and you'll advise flying units on air traffic control support.

Air Weapons Controller

Officers in air weapons control handle the interception of hostile aircraft and missiles. As an air weapons control officer you may fly as a crew member on an Airborne Warning and Control System (AWACS) aircraft. You'll use the sophisticated AWACS equipment to see and identify airborne objects. Or, you may work with ground mobile and fixed radar. You'll also electronically jam hostile radar and communications.

Operations Management

As an operations management officer, you'll plan and coordinate the use of weapons and other combat resources. You'll work in areas ranging from installing communications equipment required to keep an air base operational while it is under attack to planning tactical deception activities to confuse the enemy.



In operations management, you'll get excellent leadership and administrative experience working with other US and foreign armed forces. You'll also operate command posts, put higher headquarters policy statements into action, and plan and analyze training programs to make sure people are prepared to do their jobs safely and correctly.

Space Operations

Space operations officers work on the leading edge of technology—at everything from positioning orbiting satellites to commanding a space shuttle mission. As a space operations officer you may plan and direct a manned space flight or you may use computers and your knowledge of orbital mechanics and space sensors to track objects in space.

Scientific and Technical

Science and Engineering

Our engineers are planning the Air Force of tomorrow—today! If it has to be designed, built, tested, moved, or remodeled, our engineers will do it. Whether it's constructing a 30,000-squarefoot building on an Air Force base, developing the guidance and control systems for spacecraft and missiles, or doing flight and wind-tunnel testing on new aircraft, Air Force engineers are there. Air Force engineering opportunities include: aeronautical, astronautical, architectural, civil, electrical, and nuclear. Hundreds of diverse specialties are included in a variety of work settings.

Acquisition Management

As an acquisition-management officer, you may be involved in the life-cycle management of a major system or subsystem. You'll participate in a project from its beginning through the validation and engineering phases. You may continue to monitor a project during production or deployment.

Communications and Computers

Air Force technology is speeding into the 21st century. As an Air Force communications-computer officer, you'll be a part of this exciting process—tracing electrical impulses to a computer's brain, fine-tuning aircraft navigational aids, or translating ideas for communications-computer systems into engineering specifications.

You'll be at the forefront of technology, implementing and maintaining software, firmware, and data bases to support functional

mission requirements. With the rapid advances in communication, computer, and video technology, your expertise will influence the day-to-day activities of nearly all Air Force organizations.

Weather

As a weather officer you'll be utilizing cutting edge technology in providing timely, accurate, and relevant weather information to our nation's warfighters. You'll be an integral part of operational mission planning to provide critical weather information needed to make accurate decisions worldwide. Whether providing support from centralized, unit, or forward locations, weather officers exploit the weather to ensure mission success!

Sortie Generation and Logistics

Aircraft Maintenance

Maintaining a squadron of high-tech aircraft in mission-ready status requires the dedication of a skilled aircraft maintenance and munitions officer. You'll oversee all phases of aircraft support including armament systems and related conventional and nuclear weapons functions, avionics and propulsion systems, and disposal of unfit or unstable explosives.

Logistics

Supply and transportation come under Logistics and each is critical to carrying out the Air Force mission. As a supply officer, you're responsible for inventories worth millions of dollars—from jet planes to jet fuel. Transportation officers are the leaders who keep the supplies, people, and equipment moving.

Intelligence

As an intelligence officer you'll use some of the Air Force's most sophisticated equipment to map and interpret images. Through interpretation and assessment, you'll prepare the information that's key to combat planning. You'll be a principal decision-maker, shaping the employment of our forces.

Mission Support

Finance

In today's environment, a financial expert must make sure an Air Force organization has enough money in the right places to get the job done. You'll devise budgets and have an early opportunity to prove your leadership and financial ability while ensuring the Air Force best uses limited resources.

Personnel

The name of the personnel game is taking care of Air Force people. As a personnel officer, you'll help determine the assignments and career progression of other officers and airmen.

Contracting

As a contracting officer, you'll buy the things the Air Force needs to function—from weapons systems to supplies and services. You'll work closely with other Air Force people and civilian contractors. Advertising, negotiating, writing, and awarding contracts are some of your main responsibilities.

Manpower

As a manpower officer, you'll help decide how many people it takes to get the job done. You'll analyze time, task, and action studies. Your formulas and on-site job surveys will help drive personnel decisions.

Public Affairs

It's not a routine business. One day you may host reporters visiting your base. The next day you may conduct a meeting between base officials and local business and civic leaders. The following day you could review the base newspaper before it is published. It's a diversified career area in which you'll use all your public relations and communications skills.

Post-Graduate Education Opportunities

A few graduating cadets will receive scholarships to attend civilian graduate schools immediately after graduation. Up to three percent of each graduating class may be sent directly to medical school upon graduation. Graduates in the top 15 percent of their class will normally be assured of future graduate education for a master's degree, provided they have performed well as officers and the Air Force has a need for the degree program they wish to pursue. These graduates will be eligible for attendance after three years on active duty. Other graduates may also have opportunities for graduate education through the Air Force

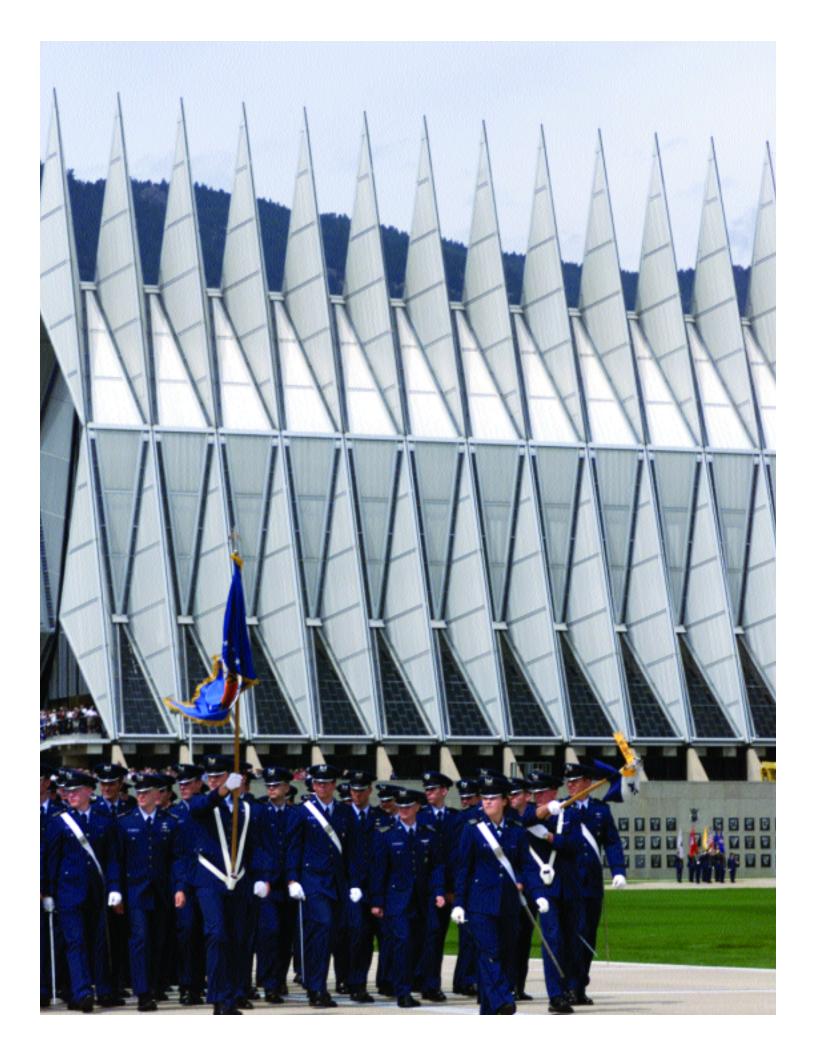
Institute of Technology (AFIT) program. Most degree-granting programs are conducted in conjunction with civilian universities. Normally during your career you'll attend one or more of the armed forces' schools for advanced professional studies. There is currently no provision for direct entry into law school upon graduation.

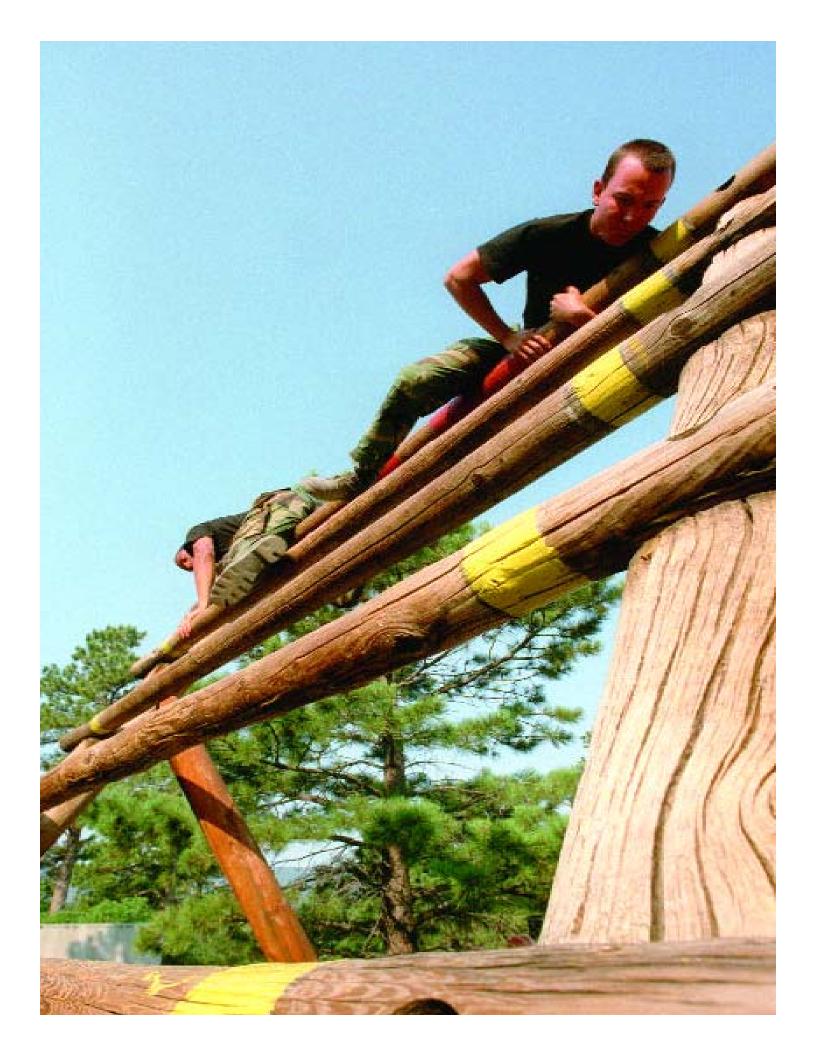
Career Opportunities

Many graduates choose the Air Force as a profession and remain in the service for at least 20 years. Professionals expect monetary reward and job security, so you can count on these benefits as an Air Force officer. Added to a competitive promotion system accompanying base salary are allowances for food, quarters, and flying or special skills, such as those for doctors. Medical, commissary, base exchange, base housing, and many other services are available to you and your dependents. Travel opportunities and a generous leave policy round out this benefits package. A sound retirement program is based on at least 20 years of military service.

As the Air Force moves into the 21st century, it faces an increasingly complex global environment. To meet the challenges ahead, we will need a number of Air Force officers with specialized language skills to operate in a multinational environment. Officers with cultural and foreign language skills interact more effectively with allies and enhance teamwork. If you are already fluent in a language other than English and have experience in a multi-national environment, you may be eligible for advanced training and assignments in the Foreign Area Officer program during your career

A career in the United States Air Force involves obligations as well as benefits. You'll be expected to be a professional, use the leadership skills you developed as a cadet, and serve your country with dedication.





Questions & Answers

WHAT IS THE CADET EQUIVALENT TO A STUDENT IN A CIVILIAN UNIVERSITY?

The Academy uses the class system rather than the equivalent designation characteristic of civilian universities. The comparison is: Fourth-class = Freshman; Third-class = Sophomore; Second-class = Junior; First-class = Senior.

I HAVE A TATTOO, A BRAND, OR A PIERCING. CAN I BE ADMITTED?

While having a tattoo or brand does not automatically disqualify you from consideration, it does open the door for rejection based on a more subjective evaluation. Non-removable piercings are not allowed and must be removed prior to admission. Air Force policy stipulates that tattoos or brands must not be excessive. Nor may they contain inflammatory, obscene, racist, sexist, or similar content. Tattoos or brands that fall into any of these categories will cause you to be disqualified for admission. The Department of Defense Medical Examination Review Board will notify the Admissions Office of any tattoos, brands, or non-removable piercings noted during your medical exam. We will then require that you provide us a color snapshot of each. Assuming your tattoo or brand falls within acceptable limits, you will be allowed to continue in the application process. You should keep the following in mind. Those who review the picture of your tattoo, brand or piercing are of an older generation and may not view body art in the same manner as you. So... if you don't already have a tattoo or brand, think long and hard as to whether the risk of possibly losing out on an Academy appointment is worth it.

WHAT IS A CADET'S DAY LIKE?

During the academic year, from early August through May, you'll have a busy schedule of classes, study periods, military training, and athletic participation. You'll awake in time to be at breakfast formation at 7:00 a.m. You'll rise in time to put your room in order, dress in the cadet uniform of the day, and meet the formation. After breakfast you'll attend morning classes which begin at 7:30 a.m. You'll attend classes or study until 11:20 a.m., when you'll go to your squadron area for the noon meal formation. You'll march to lunch with the cadet wing and have 25 minutes to eat. After lunch there are three classes or study periods in the afternoon, one of which includes Military Training (M-5), followed by athletics, squadron training, or extra academic instruction. Evening mealtime is from 5:00 to 6:50 p.m., and academic call to quarters is 7:00 p.m. Some military activities will be required in the evening, but most of the time will be devoted to studying in your room or in the library. Your day ends with taps at 10:30 p.m. The daily schedule will vary during the summer, according to the military training activity in which you're involved, but you'll be busy throughout the day.

WHAT IS A CADET ROOM LIKE?

Rooms in the two dormitories, Vandenberg Hall and Sijan Hall, are similar. Each room, which is approximately 13 feet wide and 18 feet long, is designed for two cadets. The room contains two large closets, a counter with a built-in sink, a large mirror, and a medicine cabinet. Every cadet room also has a twin size modular bed, dresser, and desk for each cadet. There is a proper location for everything you're allowed to have in your room, and you'll be expected to keep your room in perfect order.

HOW IS A CADET ASSIGNED TO A ROOM AND ROOMMATE?

Each cadet is assigned to one of 36 squadrons. Male and female cadets have separate rooms and female cadets have separate bathroom facilities within assigned squadron areas. You'll be assigned a roommate during Basic Cadet Training (BCT). Twice during the academic year you'll change roommates according to squadron policies. You'll always room with a member of the same sex and usually the same class. You may keep or change a roommate at these times, depending on your squadron's policy. If a cadet has significant problems, they may request and most likely be granted a change of roommate, if necessary. Siblings are assigned to different squadrons.



WHAT ITEMS ARE CADETS ALLOWED TO HAVE IN THEIR ROOMS?

You'll not be permitted to bring your personal possessions with you when you enter the Academy (except for a few items listed in the cadet appointee instruction booklet). All basic necessities, such as uniforms, bedding, and linens, will be furnished when you enter. During the academic year you'll be permitted to have additional items when authorized by the Cadet Wing Commander. You'll be issued a personal computer while at the Academy. You'll be permitted to have a radio or stereo equipment in your room midway through the spring semester of your fourth-class year; you must wait until your first-class year to have a television in your room. You may, at certain times, watch TV in the squadron activities room. You must wait until the second-class year to have most electrical appliances.

WHAT ARE THE CADET DINING FACILITIES LIKE?

Also called Mitchell Hall, the Cadet Dining Facility is the largest of its kind in the United States Air Force. During the academic year, the entire cadet wing assembles to eat family style breakfast and lunch meals in Mitchell Hall, with buffet style service provided for breakfast and dinner meals. The facility provides complete food service support for cadets ranging from wing tailgate parties at Falcon Stadium and organizational picnics to box lunches for official travel.

DO BASIC CADETS GET PLENTY TO EAT?

Yes, you'll have the opportunity to eat three nutritious meals a day and with all the physical activities required, you're encouraged to eat well and consume plenty of water.

ARE SPECIAL DIETARY MEALS PROVIDED?

Preparation and service of the 12,000 meals served daily in the Cadet Dining Facility prohibits offering special dietary menus based on religious faiths or individual convictions. However, during the lunch meal, cadets are offered the opportunity to sit at "lite tables" where low fat, low calorie meals are served. Vegetarian tables at lunch are available upon request, and the evening buffet also provides vegetarian fare.

WHAT IS THE RATE OF PAY FOR CADETS?

Cadets at the service Air Force Academy are currently entitled to basic pay of over \$700 per month. Cadets are also entitled to a basic allowance for subsistence of \$5.75 per day, which is used for food served at the Cadet Dining Hall. Medical and dental care are provided at no expense to cadets. Your pay is considered sufficient for you to be self-supporting, provided you are economical. The pay is not sufficient to cover any debts contracted prior to entrance, to send money home, or to spend for luxury entertainment or expensive personal items.

ARE CADETS REQUIRED TO PAY INCOME TAXES?

Yes, they are. Federal income withholding tax, state tax if applicable, and FICA (social security) are deducted from cadet pay. Each cadet must file appropriate federal and state tax returns.

WHAT TYPES OF UNIFORMS DO CADETS WEAR?

During the academic year cadets wear uniforms of blue trousers and either long- or short-sleeved blue shirts or blouses (see pages 16, 114, 125). Other uniforms are: dress uniforms with blue jacket and trousers (see page 54); mess dress for social functions. Female cadets wear either skirts or slacks with the dress uniform. Male and female cadets wear the battle dress uniform (BDUs) for military training (see pages 24, 26, 76, 79).

WHAT IS THE PURPOSE OF BASIC CADET TRAINING?

The five-week BCT program tests your mental and physical abilities and helps you make the transition from civilian to military life. You'll develop alertness, physical endurance, emotional stability, self-reliance, and individual initiative. You'll be subjected to rigorous discipline, attention to detail, and punctuality. This training lays the foundation for leadership—which is why you're here.

WHAT TYPE OF TRAINING DOES BCT INCLUDE?

BCT consists of two phases, both administered by upper-class cadets with commissioned and noncommissioned officers serving as advisors. The program is supervised by the Commandant of Cadets, who is an Air Force brigadier general. The first phase of BCT (1st BCT) takes place in the cadet area and is devoted to military orientation programs. Emphasis is placed on learning basic military skills and responsibilities, improving physical conditioning, and adapting to teamwork through competitive sports. The second phase of BCT (2nd BCT) consists primarily of field training activities conducted at the Jacks Valley encampment site, five miles north of the cadet area. You'll march to the camp site, erect a tent city, and live there for 18 days while you're in training. The activities expand your military orientation, teach you skills of weapons use, and develop your physical and mental confidence through challenging obstacles. This training demands the utmost in stamina, determination, and resourcefulness. More specific information on BCT is contained in the brochure "The Academy Experience," which the Academy provides to candidates selected for admission. You should read this brochure thoroughly.

HOW CAN I FEEL ASSURED THAT I AM PHYSICALLY PREPARED FOR BCT?

The cadet appointee kit includes specific instructions on physical preparation by the Academy's Director of Athletics. You should follow the instructions by establishing a daily aerobic workout of 30 minutes, without overtaxing or straining yourself. The Cadet Fourth-Class Council has also prepared the following advice:

Looking back on how we could have better prepared ourselves for entrance to the Academy, physical conditioning stands out first of all. The everyday strenuous conditioning activities can become discouraging and tiring if you're not in shape. If you can accomplish the 30-minute daily workout, including running at least two miles and performing the other aerobics, you should be prepared for the physical demands that will be placed upon you. However, if you have not met all of the recommended standards before arrival, you will have the opportunity to increase your physical abilities in order to keep pace with your classmates.

Blisters and tendinitis are problems experienced frequently by basic cadets. It is very important that your shoes and combat boots are properly fitted to provide comfort. You might want to purchase a pair of combat boots during your orientation and break them in before you arrive for Basic Cadet Training. You should build up your leg and ankle strength and general foot toughness before arriving. You should also be able to do pull-ups, standing long jump, push-ups, sit-ups, and run 600 meters one after the other within cadet Physical Fitness Test (PFT) standards. You'll also be required to run 1.5 miles within the Cadet Athletic Fitness Test (AFT) Standards.

DO NEW CADETS ENTER THE BCT PROGRAM IMMEDIATELY UPON ENTERING THE ACADEMY?

Yes. The first day is devoted to processing which includes clothing issue, room and squadron assignments, completing forms, a medical review, and a swearing-in ceremony. You will be asked to take the Oath of Allegiance to support and defend the Constitution of the United States and to faithfully discharge your duties as a cadet. If your parents come with you, they may want to stay for the public swearing-in ceremony on the second day.

WILL I BE TESTED ON MY PHYSICAL CONDITION WHEN I ENTER THE ACADEMY?

Yes. Testing will be done soon after arrival to measure your physical fitness and endurance. The physical fitness test areas are pull-ups, push-ups, sit-ups, standing long jump, and a 600-yard run. The aerobics test is a one and one-half mile run.

WHY IS IT NECESSARY FOR BASIC CADETS TO HAVE THEIR HAIR CUT SHORT?

BCT is the transition from civilian to military life. Part of that transition is the uniformity of hair standards for the basic cadets. The rigors of BCT put great demands on personal hygiene. The time allocated for personal hygiene needs to be maximized and short hair helps. Since the typical female inprocessing haircut takes more than 15 minutes to accomplish, you should consider having your hair cut short (the bottom of the hairline cannot touch the top of the collar) and styled prior to your arrival at the Academy. During Fall and Spring semesters, hair is cut and styled in the cadet barber shops for men and the cadet beauty shop for women. After BCT female cadets are allowed to wear hair a little longer.

I'VE HEARD BASIC CADETS REFERRED TO AS "DOOLIES." WHAT DOES THIS MEAN?

This is a term adopted by the Academy's first cadet class, the Class of 1959, when they were in BCT. Doolie is a derivative of the Greek word *duolos*, which means subject. The colloquial term is used to refer to cadets in their freshman year by most graduates and outsiders, although the cadets themselves do not typically use it.

DO BASIC CADETS HAVE ANY FREE TIME?

Yes, but very little. You may get up as early as 5:30 in the morning and go to bed no later than 10:30 at night. However, sufficient time for relaxation is built into the daily schedule. Each evening there is time to shower and attend to personal hygiene. In addition, a period, just before taps (the last bugle call before lights out), is available to study, write letters, or rest. Adequate time is allowed for sleep, meals, breaks, and religious worship.

IF I HAVE PROBLEMS ADJUSTING TO CADET LIFE, CAN I SEEK HELP?

If you experience adjustment problems, you'll be encouraged to seek assistance from counseling sources. Professionally trained officers are always available as well as upper-class cadets designated for this purpose in each squadron.

ARE PARENTS PERMITTED TO CONTACT CADETS BY PHONE DURING BCT?

No. Your parents should refrain from calling you directly during the difficult BCT adjustment period. You will write home soon after BCT starts and give your parents the name and home and duty phone numbers of your Air Officer Commanding (AOC) who directly supervises your squadron. The first opportunity you'll have to phone home will be during Doolie Day Out which is approximately halfway through BCT. Cadets and parents are strongly encouraged to communicate through cards and letters. If an AOC cannot be directly reached in the event of an emergency, call the Wing Operations Center at 719-333-2910/2911.

WHAT EVENTS ARE SCHEDULED FOR PARENTS' WEEKEND?

During Parents' Weekend (Labor Day weekend), a falcon demonstration and a parade, as well as briefings by the Superintendent, Director of Admissions, Commandant of Cadets, Dean of the Faculty, Director of Athletics, and the Command Chaplain are scheduled. While adults attend the briefings, young guests may attend free movies. There are also airmanship, dormitory, dining hall, and academic area open houses scheduled during the weekend. Guests may attend some meals in Mitchell Hall, but tickets are required.

WHAT HAPPENS AFTER BASIC CADET TRAINING IS COMPLETED?

The Acceptance Parade, with the entire cadet wing participating, marks the completion of BCT. You receive your cadet shoulder boards and become a member of the cadet wing. You can truthfully say to yourself "I did it...I thought my limitations might keep me from achieving my goal, but I overcame them and performed beyond even my own expectations." Now you enter the fourth-class academic year which extends through May. But even though the stringent BCT program has ended, you must take a rigorous schedule of classes and live under the fourth-class system.

WHAT IS THE FOURTH CLASS SYSTEM?

This system continues the cadet conversion from civilian to military life. The system prescribes the manner in which fourth-class cadets behave toward other cadets and officers. It defines those things you can and cannot do within the cadet area (dormitories, classrooms, dining hall, and other facilities). It makes you responsible for learning Fourth-Class Knowledge, including information about the Academy and the Air Force, which is contained in a booklet called "Contrails." It defines responsibilities toward keeping your personal appearance, uniforms, room, and equipment neat at all times. It requires you to display prompt obedience, proper conduct, unfailing courtesy, and unqualified honor. This system is for a definite purpose: to teach you to accomplish delegated tasks in a professional manner, thus paving the way for progression to becoming an Air Force officer. Cadets develop leadership and command skills by carrying out this program. During the spring semester of the fourth-class year, there is some relaxation of the restrictions in order to prepare you for greater privileges and different responsibilities in the third-class year.

DOES THE FOURTH-CLASS SYSTEM INTERFERE WITH ACADEMIC STUDIES?

No. The system aids and complements the academic environment. The Academy mission is a concentrated, focused process aimed at developing leaders of character through military, academic, and athletic endeavors. Your progress in all areas will be carefully monitored during all four years.

HOW CAN PARENTS HELP THEIR SON OR DAUGHTER TO EXCEL IN THE CADET WING?

Parents can encourage cadets to put forth their best efforts in all areas, and particularly, to abide by the cadet wing regulations, take responsibility for their actions, and be accountable to themselves and their supervisors. Parental support has been found to be a strong motivator toward good performance. Conversely, parents who condone violations will undermine the Academy's efforts and leave their son or daughter open to punishment and possible disenrollment. For example, statistics show that most cadets found guilty of violating the regulation that only first- and second-class cadets may own, maintain, and operate a personal motor vehicle were given a car, or received some financial assistance toward one, from their parents.

DOES THE CADET HONOR CODE APPLY TO ALL CADETS IN THE WING?

Yes. Cadets are instructed during BCT that they must agree to live by the Honor Code if they want to enter the cadet wing. The Honor Code, which defines a minimum standard for the cadet wing, serves as a basis upon which each cadet can build a personal code of ethical behavior. The Honor Code states: "We will not lie, steal, or cheat, nor tolerate among us anyone who does." The Honor Code was adopted by the Academy's first cadet class as an institutional standard in 1956, and since its acceptance, the cadet wing has exercised guardianship over it. The Academy has established a Cadet Honor Committee to help maintain high ethical standards within the wing and extend the ideals of the Honor Code.

WHAT IS MEANT BY THE TERM "TOLERATION"?

The Honor Code clearly states that cadets will not tolerate a violation of the code by another cadet. Experience with the code has proven that this is the strong point in maintaining its effectiveness. The Academy's major honor problems have grown out of minor ones. Isolated individual honor violations were tolerated by other cadets, and this encouraged the spread of more honor violations within the cadet wing. The necessity for intolerance of such violations becomes even clearer when one considers the purpose of our training: to produce officers who will responsibly serve their country rather than their personal interests. The non-toleration clause represents the spirit within the cadet wing to hold its standards high and to protect them. A cadet who suspects or knows of an Honor Code violation is first encouraged to speak with the suspected cadet. However, if the cadet has difficulty in coping with the situation, the person is encouraged to talk with a cadet honor representative.

HOW DOES THE HONOR CODE OPERATE?

The administration of the Honor Code is accomplished by a joint effort between cadets and Academy officers. Each possible Honor Code violation is thoroughly investigated on the premise that the

accused cadet is honorable until a sufficient amount of reasonable evidence shows otherwise. The primary sanction for code violations is dismissal from the Academy. Some cadets, however, are retained on probationary status. The main concern in the administration of the code is that fairness and equity be maintained while teaching the importance of personal responsibility, and the rights of the cadets are fully protected during this process. Cadets are taught the specifics of the administration of the Honor Code during BCT and throughout the Academy experience.

WHAT COMPRISES THE ACADEMY'S LEADERSHIP PROGRAM?

The Academy Leadership Development Program is the "road map" to cadet development and a continuous aspect of life at the Academy from BCT to graduation. This program focuses on the Academy core values: *integrity first, service before self, and excellence in all we do.* You must internalize these core values in order to prepare yourself for a career of military service to the nation. As a cadet, you'll be held accountable to your cadet and officer chain of command. You'll gain experience through numerous, diverse, coordinated activities that contribute to your leadership development.

WHAT MILITARY COURSES ARE REQUIRED?

Several military courses are required during the academic year. Under the leadership of the Commandant of Cadets, the 34th Education Group has developed one required or "core" course for three of the four years at the Academy. These courses stress airpower heritage, professionalism, officership, the art of war, military theory, doctrine, and force employment. They also emphasize decision making in combat as well as leadership and commitment to duty, honor, and country. The courses are phased and integrated so each course builds logically towards graduation and commissioning. Other military courses are included in the summer. During the third-class summer, all cadets take Combat Survival Training. This three week course, conducted at the Academy and in the nearby Rocky Mountains, simulates the experience of an aircrew member who is forced down in unfamiliar territory. Another mandatory summer course is a three week tour of duty with an operational Air Force unit to gain insight into Air Force operations, the working environment and a 9-day barebase deployment training course. First- and second-class cadets are also required to assume at least one leadership position in summer training courses, such as BCT.

DO CADETS EARN AIR FORCE FLYING RATINGS?

Cadets do not earn Air Force "wings" at the Academy. However, cadets who complete several airmanship and navigation courses during their four years can gain sufficient flight experience which serves as excellent preparation for pilot or navigator training after graduation.

WHAT FLYING COURSES ARE AVAILABLE?

Qualified cadets who wish to attend pilot training after graduation are required to complete the Introductory Flight Training (IFT) Program during their first-class year or prior to attending Undergraduate Pilot Training (UPT). While attending IFT, individuals earn their Private Pilot License. Cadets may also enroll in additional courses in avionics, astronomy, special topics in aviation, and Air Force operations.

ARE EXTRACURRICULAR FLYING COURSES AVAILABLE?

Yes. Cadets may participate in flying through extracurricular programs such as soaring, parachuting, and the Cadet Aviation Club. Soaring training is held on a year-round basis and is available to every cadet. The basic course includes dual and solo instruction involving approximately 15 flights. Upper-class cadets can compete for selection to Soaring Instructor Pilot Training. Once qualified, the cadet instructors, who are supervised by rated Air Force officers, instruct other cadets. Some selected upper-class cadets who have completed advanced flying programs may earn a Federal Aviation Administration (FAA) certificate through the rating of flight instructor and join the Soaring Society of America. All soaring is conducted in either Academy sailplanes or powered gliders. Parachute training is also available to selected cadets who volunteer and meet stringent physical requirements. The basic parachuting course involves five freefall jumps. Some selected cadets from the basic course will take advanced courses to become parachute instructors for other cadets. These

instructors, known as jumpmasters, may become members of the "Wings of Blue" parachute team and may qualify for a US Parachute Association rating. The Cadet Aviation Club is open to all cadets who are interested in pursuing flying as an extracurricular activity. As members of the club, cadets can earn FAA ratings from private pilot through instructor pilot. Also, selected cadets may become members of the Cadet Competition Flying team.

WHEN DO CADETS FIRST ENTER THE ACADEMIC PROGRAM?

After you've completed BCT and have been admitted to the cadet wing, you'll be scheduled for classes at the beginning of the academic year in early August. The year is divided into two semesters, each containing approximately 17 weeks of instruction, with breaks scheduled for holidays and leave periods.

DO ALL CADETS TAKE THE SAME CLASSES?

The Academy requires all cadets to take a core academic curriculum. This core curriculum covers a broad spectrum of classes in humanities, social sciences, engineering, and basic sciences. This core load makes up 109 semester hours of the academic program and is the foundation for a cadet's future service as an officer in the Air Force. Cadets then receive further specialization in one of 30 Academy majors currently offered.

ARE CADETS COUNSELED ON THE SELECTION OF A MAJOR?

Most definitely. Cadets are advised by Academic Advisors who discuss the academic majors in relation to career areas and opportunities in the Air Force. After selecting a major, you'll be assigned to a faculty advisor from an academic department who will assist you with course selections, schedules, and other academic matters.

CAN CADETS TRANSFER CREDITS OR VALIDATE COURSES?

When you enter the Academy, you'll take several validation tests offered by the various academic departments. Successful completion of a test will enable you to be placed in an accelerated or advanced course, or perhaps to receive validation credit and substitute another course. Transcripts of new cadets who have prior college credit are reviewed by representatives from each department. Credit may be awarded for any college course satisfactorily completed which is equivalent to a course in the Academy curriculum. A cadet who passes a validation examination or who makes an acceptable score on a College Board Advanced Placement examination may also earn validation credit. Departments certify this credit to the Office of Registrar, Customer Service.

CAN CADETS TAKE ELECTIVE COURSES?

Many electives are offered, and cadets who receive transfer or validation credit may substitute electives for those particular courses. Cadets with a prescribed Grade Point Average (GPA) may also overload during most semesters, allowing them to take other non-prescribed courses. Every cadet, however, must remain at the Academy for four years, no matter how many extra course credits are earned. Every cadet, also, must take a certain number of classes each semester. They'll usually take six academic courses per semester (except for fourth-class cadets who only take five courses their first semester).

HOW ARE CADETS GRADED ON THEIR COURSES?

A computerized grading system enables instructors to keep a continuous evaluation of each cadet's performance on quizzes, examinations, homework, or classroom recitations. A progress grade report is published at mid-semester, and a final grade report is issued at the end of the semester. Most courses are graded by means of letter grades (A, A-, B+, B, B-, C+, C, C-, D, F) with equivalent grade-point averages (4.0, 3.7, 3.3, 3.0, 2.7, 2.3, 2.0, 1.7, 1.0, 0). An incomplete (I) grade is given to a cadet who does not complete the academic requirements because of incapacity, emergency, or failure to finish an essential assignment. Some courses are graded pass/fail and have no effect on grade-point averages.

DO PARENTS RECEIVE TRANSCRIPTS OF CADET GRADES?

Most parents are curious about their cadet's grades and academic progress at the end of each semester. The policy regarding the release of student grades to parents is dictated by the Federal Family Educational Rights and Privacy Act of 1974. This law specifies that educational records of the students may not be released without (1) the written consent of the student which specifies those educational records to be released and to whom, or (2) judicial order or subpoena of the student's educational records. In the latter situation, the student must be notified of the institution's compliance with the order or subpoena.

Based upon this policy, the United States Air Force Academy provides grade reports directly to the cadet and will provide grade reports to the parents at the written direction of the cadet. We understand and appreciate the concern and interest of parents; however, parents must receive this information either directly from the cadet or by the cadet's written request that a grade report be mailed to the parent.

CAN CADETS WITH MARGINAL GRADES SEEK HELP?

Cadets are encouraged to contact their instructors at any time to request extra instruction outside the classroom. Faculty instructors want to assist cadets who need individual tutoring. An Academic Review Committee (ARC), consisting of several officers from various organizations, interviews cadets having academic difficulty and recommends remedial action. The Student Services Center has programs, facilities, and personnel dedicated to assist cadets interested in improving their performance.

WHERE CAN CADETS OF ALL PERFORMANCE LEVELS GO TO RECEIVE ADDITIONAL ASSISTANCE?

The Student Services Center provides a full range of instruction to improve cadet learning techniques. The benefits of being an independent and confident learner are immeasurable. Resources available are: the writing center, one-on-one academic tutoring, advising, seminars, handouts, and enrollment in Strategies for Academic Success or Reading Enhancement Courses. Cadets are welcome to drop by and pick up literature on topics such as time management, procrastination avoidance, note taking, effective textbook reading, better listening skills, and test strategies.

WHEN IS A CADET CONSIDERED ACADEMICALLY DEFICIENT?

A cadet is considered deficient in academics if one or more F or I grades is received on a grade report, or if the cumulative, core, or most recent semester GPA falls below 2.0. A first-class cadet is also deficient if the major GPA falls below 2.0. At mid-semester, most deficient cadets will be placed on academic probation and will be reviewed by a Class Committee. In addition, cadets on probation will be assigned certain weekend study periods. At the end of the semester, if seriously deficient, the cadet's record will be reviewed. The board may recommend either dismissal of the cadet, or continuation on academic probation with appropriate remedial actions. The board can direct attendance at the academic summer school held at the Academy.

ARE CADETS GRADED ON THEIR MILITARY PERFORMANCE?

Yes. All Academy personnel who instruct, supervise, or coach cadets submit a military performance appraisal on each cadet. These inputs are used to create the Military Performance Average (MPA) similar to the academic GPA. Militarily deficient cadets may be placed on Conduct and/or Aptitude probation for serious rules violations or accumulating a history of violations. Placement on Conduct and/or Aptitude probation usually results in an MPA below 2.0. Cadets who fall below a 2.0 MPA will meet a Military Review Committee (MRC) similar to an ARC which reviews academic deficiencies. The MRC may place a cadet on aptitude probation, initiate corrective action, or make recommendations to the Commandant or the Academy Board.

DO CADETS RECEIVE ANY SPECIAL RECOGNITION FOR OUTSTANDING GRADES?

Cadets who achieve at least a 3.0 GPA are recognized by the Dean of the Faculty and wear a small silver star on their uniform. Cadets who are recognized for achievement in military performance by

the Commandant of Cadets wear a silver wreath. Cadets who are recognized for excellence in physical education by the Director of Athletics wear a silver lightning bolt. Those cadets on all three lists are recognized by the Superintendent and wear the star enclosed in the wreath between two small lightning bolts.

WHEN DO CADETS STUDY?

Study periods are scheduled during the day when cadets do not have classes. After dinner each evening, from Sunday through Thursday, cadets are expected to study in their rooms or in the library. Cadet tutors are arranged by second-class squadron academic noncommissioned officers for cadets experiencing academic problems.

WHAT TYPE OF FACULTY DOES THE ACADEMY HAVE?

The Academy has a military and civilian faculty. The military faculty is composed primarily of Air Force officers with a few officers from the other branches of the US Armed Forces and from the military forces of allied nations who serve in a liaison capacity. The civilian faculty is composed of both government employees and visiting faculty. The civilian government employees are on renewable term appointments and hold all academic ranks as well as several administrative positions. The civilian visiting faculty members come to the Academy from academic institutions, government agencies, and industry and are assigned to academic departments for one or two years. The faculty is organized by academic divisions and departments, similar to other institutions of higher education. The Dean of the Faculty and all Permanent Professor positions have been established by law.

WHAT TYPE OF INSTRUCTION DOES THE FACULTY PROVIDE?

The average class is small, 15 to 20 students, which allows the instructor to establish a rapport with each cadet and to recognize a student's strengths and weaknesses. The faculty uses the seminar approach to instruction, when possible, keeping lectures to a minimum. Cadets are expected to prepare for their lessons and participate in classroom activities.

WHAT LIBRARY FACILITIES ARE AVAILABLE?

The Academy Library, with a collection of over 700,000 volumes, supports the academic, research, and recreational needs of all cadets and faculty members. The library has accumulated one of the most outstanding aeronautical collections in the nation. Other useful features of the library are the current periodical and newspaper collections, the microform collections, and listening rooms for musical and narrative records and tapes. With a seating capacity for 1,300 readers, the library has open book stacks to afford complete access to materials.

HOW DOES THE ACADEMY'S ACADEMIC PROGRAM COMPARE WITH OTHER INSTITUTIONS?

The Air Force Academy has instituted many new concepts in service academy instruction and is recognized as an outstanding educational institution. Academy graduates have won an impressive number of Rhodes Scholarships, Truman Scholarships, National Science Foundation Fellowships, and other major competitive awards. We feel this record reflects the excellence of the Academy's academic program. In 2003, USAFA was ranked #2 in the nation for academic experience by the *Princeton Review*, #2 in the nation for Aerospace/Aeronautical/Astronautical schools with a bachelor's degree and #5 in the nation for Electrical/Electronic/Communications schools with a bachelor's degree by *US News and World Report*.

DO ALL CADETS PARTICIPATE IN THE ATHLETIC PROGRAM?

Yes. All cadets are required to participate in the athletic program, which includes physical education courses and competitive sports. Athletic participation contributes greatly to those attributes normally associated with the development of Air Force leadership potential. Participation helps you develop courage, initiative, and the will to win. Most cadets find that they enjoy sports as a release from academic schedules, and many become skilled beyond their expectations.

WHAT DOES THE ATHLETIC PROGRAM INCLUDE?

During your first summer in BCT, you'll undergo strenuous physical training to develop strength, endurance, agility, and coordination. Conditioning exercises, an obstacle course, and a confidence course are part of this training. During fall and spring semesters, you'll take physical education courses which are part of the curriculum. The physical education instruction includes: seven core courses, four core electives and one open elective, divided among academic, aquatic, combative, developmental, lifetime, and team skills. All cadets also receive extensive instruction in competitive athletics either through the varsity athletics or intramural programs.

CAN A CADET BE DISENROLLED FOR POOR ATHLETIC PERFORMANCE?

Yes. Cadets who fail to pass the Physical Fitness Test (PFT) or the Aerobic Fitness Test (AFT) will meet a Physical Education Review Committee which reviews athletic deficiencies. The Physical Education Review Committee may place a cadet on athletic probation, initiate corrective action, or make recommendations regarding retention to the Director of Athletics or the Academy Board.

DOES THE ATHLETIC PROGRAM DIFFER FOR MEN AND WOMEN?

Women participate in all athletic activities except boxing, football, and baseball. Women have their own intercollegiate teams in volleyball, basketball, cross-country, fencing, gymnastics, soccer, swimming, tennis, and indoor and outdoor track. Women can also compete for places on the varsity rifle team.

WHY IS THE FALCON THE ACADEMY MASCOT?

The falcon possesses characteristics which typify the US Air Force: speed, graceful flight, courage, alertness, and noble carriage. Several prairie falcons, which are native to Colorado, and one white gyrfalcon are housed at the Academy. The falcons are trained by cadet falconers who teach them to perform demonstrations during half-time activities at football games. The Academy's intercollegiate athletic teams are known as "The Falcons."

WILL I BE ABLE TO TRAVEL INTO TOWN OR ABROAD?

The Academy refers to passes as permission for cadets to leave the Academy during off duty periods. Your individual passes on Friday evening and Saturday will depend on your class and on your overall squadron performance. As a basic cadet, you'll not be permitted to have visitors except for a scheduled cadet function. When you become a fourth-class cadet, you'll be allowed to use Arnold Hall, the cadet social center, and to entertain guests there on weekends after Parents' Weekend. You'll also be permitted to dine out in the homes of Academy personnel on certain occasions and to attend home athletic events and other scheduled activities of the cadet wing. Authorizations and liberties are gradually increased by class in recognition of added maturity and responsibility.

WHAT LEAVE PERIODS DO CADETS HAVE?

Cadets have a leave period over Thanksgiving, two and a half weeks for Christmas, and one week in the spring semester. During the summer cadets take required leadership programs which are held at the Academy or other installations. Either before or after a leadership program, most cadets in the upper three classes have approximately three weeks of leave. There are exceptions for cadets who volunteer or who are required to attend summer school; in these cases leave periods must be forfeited.

ARE CADETS PERMITTED TO WEAR CIVILIAN CLOTHES AWAY FROM THE ACADEMY?

Fourth-class cadets may wear civilian clothes during leave periods, such as Thanksgiving and Christmas, and when authorized by the Commandant of Cadets. This authorization usually occurs during the spring semester. Cadets who are representing the Academy on special programs, such as speaking appearances in their hometowns, must wear their uniforms.

WHERE DO CADETS GO ON WEEKENDS?

Colorado Springs is the nearest city, approximately eight miles south, and has a population of more than 300,000. Denver, 55 miles to the north, has over one million population. Both cities are located in the heart of the Rocky Mountain tourist area, known as "Ski Country, USA." Because of their tourist attractions, these cities have many advantages and recreational facilities including a variety of restaurants, museums, theaters, nightclubs, shopping centers, athletic facilities and sporting events. Colorado Springs is an important training site for athletes who practice yearly for the Olympics. Denver is the primary access city leading to many mountain resorts, ski areas, and scenic drives. The cities of Boulder and Fort Collins also offer many cadets the opportunity to "get away from it all". Many cadets go to ski resorts for a day or weekend of skiing and fun. The Cadet Ski Club provides free transportation and inexpensive ski equipment for these outings. River rafting, mountain climbing and horseback riding are some of the other popular recreational activities available in the area. After BCT Air Force families participating in the sponsor program host one or more cadets for periods of relaxation—an opportunity to enjoy a home-cooked meal and telephone your parents.

WHAT TYPES OF RECREATION ARE AVAILABLE TO CADETS?

The Academy provides opportunities for you to enjoy a change of pace through participation in cadet activities and social functions. This comes as a welcome break from the military activities, academic requirements, and athletic participation of the busy school week. You'll find the Arnold Hall social center a relaxing place to enjoy dancing, games, movies, entertainers, and television. The snack bar in the Richter Lounge is popular with cadets. The cadet wing social committees arrange coed dances, both formal and informal.

ARE CADETS EXPECTED TO ATTEND CERTAIN SOCIAL FUNCTIONS?

Yes. Cadets are expected to dress in formal uniforms and to attend scheduled dinners with their squadron or their class in Mitchell Hall. Attendance at these functions will give you experience in social situations which may be expected of you as an officer. You'll receive a Decorum handbook which contains information on proper etiquette for various social occasions. Decorum is taught in cadet squadron military training classes.

WHEN DO CADETS ATTEND CHAPEL SERVICES?

Attendance is on an optional basis. Many cadets attend Sunday or Sabbath services in the Cadet Chapel, which has separate areas for Protestant, Catholic, and Jewish services. There is also an all-faith meeting room for members of other religious faiths. Cadets are permitted to attend a church of their choice in the local community, and many volunteer to teach Sunday school classes. Cadets participate in several other religious activities including choirs, study groups, daily worship, and fellowship organizations. Early morning daily Chapel is also available.

WILL I HAVE AN OPPORTUNITY TO BECOME A PILOT OR NAVIGATOR?

Yes. While at the Academy cadets obtain a solid background in all phases of aviation. Male and female cadets are considered for flying training if they meet the flying physical qualifications and are selected to fill available openings. Undergraduate Flying Training (conducted after graduation at several US bases) prepares qualified graduates for flying careers in airlift, bomber, fighter, multirole, special ops, or transport aircraft.

DO GRADUATES HAVE A CHANCE TO OBTAIN AN ADVANCED DEGREE?

A few graduates will obtain scholarships to attend civilian graduate schools immediately after graduation. Graduates in the top 15 percent of their class on overall performance average will normally be assured of future graduate education for a master's degree, provided they have performed well as officers and the Air Force needs the degree program they wish to pursue. These graduates will be eligible for attendance after three years on active duty. Other graduates may also have opportunities for graduate education through the Air Force Institute of Technology (AFIT) program. Most degree-granting programs are conducted in conjunction with civilian universities. In addition, many Academy graduates attend one or more of the armed forces professional military schools during their careers.

CAN GRADUATES ENTER MEDICAL SCHOOL?

The Air Force may send up to three percent of each graduating class directly to medical school upon graduation. Additionally, up to one half percent of each graduating class may be selected to attend dental school, with another one half percent being selected to attend nursing school. This, in effect, brings the total percentage that might be selected to attend Health Professions Post-Graduate education to 4 percent. These graduates complete their training through the Armed Forces Health Professions Scholarship Programs, or the Uniformed Services University of the Health Sciences. These same two programs are available to all active duty officers. Selection for these programs is on a competitive basis, and the number of students will be based on the needs of the Air Force.

CAN GRADUATES ENTER LAW SCHOOL?

The Air Force currently has no provision for graduating cadets to enter directly into law school. Congress has authorized the Air Force to enter a small number of active duty Air Force officers into law school each year. An Academy graduate, as well as any other Air Force officer, must complete two years of active duty before becoming eligible for consideration. Selection for sponsorship to law school is on a competitive basis among all active duty officers who apply.

WHAT ARE SOME OF THE BENEFITS OF AN AIR FORCE CAREER?

The pay and allowances of a new officer compare favorably with starting salaries in business, industry, and the professions. An officer advances in rank according to the needs of the Air Force and professional performance. The Air Force puts a high premium on leaders with vision, dedication, and ability. It offers a stimulating challenge and an interesting future in a wide spectrum of fields for Academy graduates to employ their leadership talents. There are opportunities for advanced education. All career officers are eligible to apply for further education through AFIT at civilian colleges and universities. Selected officers attend on a full-time basis, receive pay and allowances, have their tuition and fixed fees paid, and receive some reimbursement for books and thesis expenses. During each move, reimbursement for transportation costs, an extra allowance for incidental expenses of moving, and free shipment of household goods are provided. Additional benefits are: medical and hospital expenses, commissary and base exchange privileges, officers club privileges, VA and FHA mortgage loan insurance, group life insurance, and 30 days of vacation with pay each year. The current law enables an officer to retire after completing 20 years of active service.





Appendix A

The Department of Defense Medical Examination Review Board (DODMERB) is responsible for determining if you are medically qualified for admission into the Academy. After you have completed a medical and optometric (eye) examination, DODMERB will inform you and the Academy of your medical status. DODMERB or a civilian contractor will contact you to schedule these appointments. The government will pay for a complete physical examination. If there is a need for additional medical tests or evaluations, you may use the military medical treatment facilities of any Service (Army, Navy, Air Force, or Coast Guard) at no cost or you may use your own physician or optometrist, as appropriate, at your own expense. Applicants may visit https://dodmerb.tricare.osd.mil to access information about DODMERB (option tab "About DODMERB") and then go to "Frequently Asked Questions" (option tab FAQs), or for tracking your medical status click on option tab "Applicant". You should use this website as your first method of obtaining information from DODMERB.

Before you take the medical examination, review your medical history with your parents and your family physician. The examining facility must compile the medical history carefully and in detail, including complete documentation of all illnesses, injuries, and operations. To avoid delay in evaluation of your medical qualification, obtain statements from your attending physician or from hospital records concerning any past or present medical care and present them to the examining facility when you report for the examination. You also must bring photo identification.

As part of their medical examination, all applicants will undergo an external visual inspection of the genitalia to determine if any abnormalities are present; a woman may have this part of her exam done by her private physician at her expense.

Following your acceptance by the Air Force Academy and within 72 hours after your arrival at the Academy, you must undergo drug and alcohol abuse testing as required by Public Law (Title 10, U.S. Code, Section 978). HIV testing will also be accomplished at this time. Photo identification is required.

Refer questions concerning your medical status or examination scheduling to DODMERB, 8034 Edgerton Drive, Suite 132, USAF Academy, CO 80840-2200. Submit all requests for medical waivers to the Academy Office of Admissions, HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025.

Vision Requirements

All candidates admitted to the Air Force Academy must meet the vision requirements for commissioning in the United States Air Force. Qualification for flying duties requires meeting more stringent visual acuity, refractive error, color vision, and depth perception standards. Pilot/navigator qualified status is not determined until the year of graduation.

Nearsightedness (myopia) commonly develops in the late teenage years. Therefore, it is possible you could meet the vision requirements for a flying career upon admission but not at graduation, thereby precluding you from ultimately being pilot or navigator qualified. Procedures to reverse the nearsightedness, including radial keratotomy and similar surgical and non-surgical alterations to the cornea (orthokeratology), and experimental operations (photokeratectomy), disqualify you for all military programs.

If you wear contact lenses, you must remove hard lenses (to include gas permeable lenses) at least 21 days, and soft lenses three days, before the vision examination. An examination conducted without the required removal of contact lenses for the designated time is invalid and will delay your medical examination processing. If you wear prescription eyeglasses, bring them with you at the time of your physical examination. After you enter the Academy, periodic vision care and counseling will be provided at the eye clinic.



Medical Standards

All candidates admitted to the Air Force Academy must meet the medical and weight standards for a commission in the United States Air Force. If you don't maintain the standards as a cadet, you may be

disenrolled. DODMERB will carefully evaluate your medical examination report. We have included a general list of medical standards that apply to all applicants.

Potential Pilot and Navigator

Visual Acuity

Qualification for potential flying duties requires uncorrected distant visual acuity no worse than 20/50 (pilot) and 20/200 (navigator),



45

correctable to 20/20 in each eye. Uncorrected near visual acuity worse than 20/20 (pilot) and 20/40 (navigator) must be correctable to 20/20 in each eye.

Refractive Error

The refractive error limits to qualify for potential flying duties are +2.00/-1.00 in any meridian and 0.75 astigmatism (pilot) and +3.00/-2.25 in any meridian and 2.00 astigmatism (navigator).

Color Vision and Depth Perception

Successful completion of the Pseudoisochromatic Plates or Farnsworth Lantern color vision tests and the Vision Test Apparatus-Near and Distant (VTA-ND) or Titmus Stereofly or Randot Stereo or Verhoeff depth perception tests is required. These standards are the same for both pilot and navigator qualification.

Hearing Standards

H-1 Profile. The H-1 profile qualifies applicants for Flying classes 1 and 1A, initial Flying Class II, and initial III, Air Force Academy, special operational duty, and selected career fields.

Definition: Unaided hearing loss in either ear no greater than: 500 1000 2000 3000 4000 6000 Frequency Loss 25 25 25 35 45

Standing Height

64 inches minimum to 77 inches maximum for both pilot and navigator qualification.

Sitting Height

34 inches minimum (pilot) and 33 inches minimum (navigator) to 40 inches maximum (both), measured while sitting erect, the distance from top of head to chair seat.

Commission

Visual Acuity

Distant: correctable to 20/40 in one eye and 20/70 in the other, or 20/30 in one eye and 20/100 in the other, or 20/20 in one eye and 20/400 in the other.

Refractive Error

Farsightedness (hyperopia) no greater than +8.00 diopters and nearsightedness (myopia) no greater than -8.00 diopters spherical equivalent.

Standing Height

Male—not less than 60 inches to 80 inches maximum. Female—not less than 58 inches to 80 inches maximum.

Weight

See the height/weight chart on page 180.

Hearing

Maximum hearing loss in either ear cannot be greater than the following:

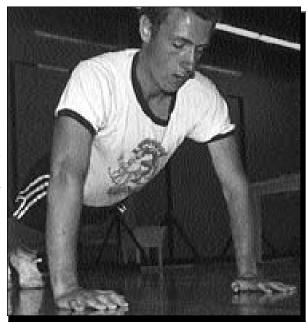
Frequency	500	1000	2000	3000	4000
Loss	35	35	35	45	55

Pure tone at 500, 1000, and 2000 cycles per second of not more than 30 dB on the average (either ear),

with no individual level greater than 35 dB at these frequencies; and level not more than 45 dB at 3000 cycles per second each ear, and 55 dB at 4000 cycles per second each ear.

Height-Weight Standards

Weight standards are determined by height and sex (see the Height and Weight Table). If you exceed the Air Force weight standards, you must undergo a procedure to determine your percent body fat. The maximum allowable body fat is 20% for males and 28% for females. Once the maximum weight standard has been exceeded, the body fat standard becomes the entry requirement unless you subsequently meet the weight standard.



	Men				Women				
Inches (cm)		Minimum		Maximum		Minimum		Maximum	
		lbs	(kg)	lbs	(kg)	lbs	(kg)	lbs	(kg)
58			Pol <u>111</u> 59.			88	(39.99)	132	(60.00
59				V		90	(40.90)	134	(60.90
60	(152.40)	100	(45.45)	153	(69.54)	92	(41.48)	136	(61.81
61	(154.94)	102	(46.36)	155	(70.45)	95	(43.18)	138	(62.72
62	(157.48)	103	(46.81)	158	(71.81)	97	(44.09)	141	(64.09
63	(160.02)	104	(47.27)	160	(72.72)	100	(45.45)	142	(64.54
64	(162.56)	105	(47.72)	164	(74.54)	103	(46.81)	146	(66.36
65	(165.10)	106	(48.18)	169	(76.81)	106	(48.18)	150	(68.18
66	(167.64)	107	(48.63)	174	(79.09)	108	(49.09)	155	(70.45
67	(170.18)	111	(50.45)	179	(81.36)	111	(50.45)	159	(72.27
68	(172.72)	115	(52.27)	184	(83.63)	114	(51.81)	164	(74.54
69	(175.26)	119	(54.09)	189	(85.90)	117	(53.18)	168	(76.36
70	(177.60)	123	(55.90)	194	(88.18)	119	(54.09)	173	(78.63
71	(180.34)	127	(57.72)	199	(90.45)	122	(55.45)	177	(80.45
72	(182.88)	131	(59.54)	205	(93.18)	125	(56.81)	182	(82.72
73	(185.42)	135	(61.36)	211	(95.90)	128	(58.18)	188	(85.45
74	(187.96)	139	(63.18)	218	(99.09)	130	(59.09)	194	(88.18
75	(190.50)	143	(65.00)	224	(101.81)	133	(60.45)	199	(90.45
76	(193.04)	147	(66.81)	230	(104.54)	136	(61.81)	205	(93.18
77	(195.58)	151	(68.63)	236	(107.27)	139	(63.18)	210	(95.45
78	(198.12)	153	(69.54)	242	(110.00)	141	(64.09)	215	(97.72
79	(200.66)	157	(71.36)	248	(112.72)	144	(65.45)	221	(100.4
80	(203.20)	161	(73.18)	254	(115.45)	147	(66.81)	226	(102.72

Medical Waivers

The Air Force Academy Surgeon (Waiver Authority) may grant a limited number of waivers for medical disqualification. A medical waiver will allow you to be admitted to the Academy with a medical disqualification. You may request a waiver by writing a letter to HQ USAFA/RRS, 2304 Cadet Drive, Suite 200, USAF Academy, CO 80840-5025.

Medical Disqualification

Following is a list of some of the medical conditions that are disqualifying. This is not intended to be a complete or comprehensive list but only a guideline of the most common medical disqualifications. If you are found to be medically disqualified, you may request a medical waiver through the Air Force Academy Admissions Office. Approximately 50% of all waivers requested are granted.

Vision Disqualification

Procedures to change the refraction including radial keratotomy (RK), photo-keratectomy (PRK), laser in situ keratomileusis (LASIK), etc. and similar surgical and non-surgical alteration to the cornea (orthokeratology), and experimental operations disqualify you for all military programs. Waivers may be considered for both PRK and LASIK, however, the waiver applicant must meet very strict preoperative and post-operative criteria. Waiver will not be considered until 12 months following the procedure to ensure full healing. LASIK is permanently disqualifying for any flying or special duty career field. Refractive errors in spherical equivalent of greater than +/-8.00 diopters are disqualifying and greater than +/-10 are not waiverable.

Dental Disqualification

Diseases of the jaw or associated tissues which are not easily remediable, and will incapacitate the individual or otherwise prevent satisfactory performance of duty can cause disqualification. Most malocclusion waivers are granted.

Ears and Hearing

Hearing must meet the acceptable levels for commissioning. Hearing loss greater than 35 decibels in the speech frequencies is disqualifying.

Respiratory System Disqualification

History of asthma, including reactive airway disease, exercise induced broncho-spasm, or asthmatic bronchitis, reliably diagnosed at any age is disqualifying. History of recurrent wheezing requiring medication after age 12 is also disqualifying. Current immunotherapy for allergies is disqualifying but usually waiverable.

Heart and Vascular System Disqualification

Any abnormalities of the heart valves, major vessels, heart rate or rhythm may require additional examination procedures.

Genitourinary System Disqualification

Persistence of abnormal findings on urinalysis, a history of bedwetting into adolescence, or physiologic or anatomic abnormalities.

Gastrointestinal System Disqualification

Chronic disease of the abdominal organs. Chronic or recent hepatitis including hepatitis B carriers. Inflammatory bowel disorders.

Skin Disqualification

Chronic diseases of the skin such as psoriasis, atopic dermatitis and eczema are cause for disqualification. Waivers may be considered for some mild conditions.

Musculoskeletal System Disqualification

Ununited fractures, history of instability of a major joint, certain retained orthopedic fixation devices, severe scoliosis. Any condition which could interfere with daily participation in rigorous physical training or athletic programs, wearing of military equipment, or detract from military bearing and appearance. History of ACL reconstruction is disqualifying but usually waiverable.

Neurological and Psychiatric Disorders

Seizure disorders (except febrile convulsions in childhood), recurrent or severe headaches. History of mental illness, learning disorders, and/or any other disorders which may interfere with performance of military duties.

Physical Aptitude Examination (PAE)

Applicants who enter the candidate phase of the admissions process normally take the Physical Aptitude Examination (PAE) which measures coordination, strength, endurance, speed and agility. The PAE will be administered at your school by a coach, PE teacher, or your Liaison Officer. The required events and the minimum scores necessary for admission follow; however, you should do the best you can on each event.

Exercise	Men		Women	
	Minimum	Average	Minimum	Average
Pull-ups (men)	- 5	10	N/A	N/A
Flexed-arm Hang (women)	N/A	N/A	21 seconds	24 seconds
Standing Long Jump	6'10"	7'10"	5'08"	6'02"
Modified Basketball Throw	54'	67'	28'	39'
Push-ups (2 minutes)	25	47	10	28
300-yard Shuttle Run	65 secs maximun	n 60 seconds	79 secs maximum	68 seconds

Pull-ups (men)

From a straight-arm hang of at least three seconds on a horizontal bar with elbows locked and palms away from the face, raise your body upward until your chin is lifted over the bar without tilting your head backward. Return to the straight-arm hang position with elbows locked and repeat as many times as possible with the body held approximately straight. Kicking or swinging of your feet invalidates the pull-up.

Flexed-arm Hang (women)

Climb up the ladder until your chin is above the bar. Grasp the bar with your hands shoulder width apart. The backs of your hands must be toward your face, thumbs under the bar. On the command "Begin", step off the ladder. Simultaneously, an assistant will remove the ladder and prevent any forward swinging of the legs. Your chin must remain level above the bar for at least 21 seconds. The stopwatch is started once you are free of the ladder. The event stops when: a.) your chin rests on the bar (if it inadvertently touches the bar, but does not rest on it, the test continues); b.) your head tilts backward to keep the chin above the bar, or c.) your chin falls below the level of the bar. Only one trial is allowed.

Standing Long Jump

Standing with your feet immediately behind the take-off line, bend the knees and swing your arms one or more times, then jump forward to cover the greatest distance possible. Distance is measured from the take-off line to the rearmost heel. You may not take a preliminary hop or step. If you lose your balance and fall backward, another trial is permitted. You must take off with both feet simultaneously and land on both feet simultaneously. You must complete a maximum of three correctly executed jumps. Your score will be your longest jump.

Modified Basketball Throw

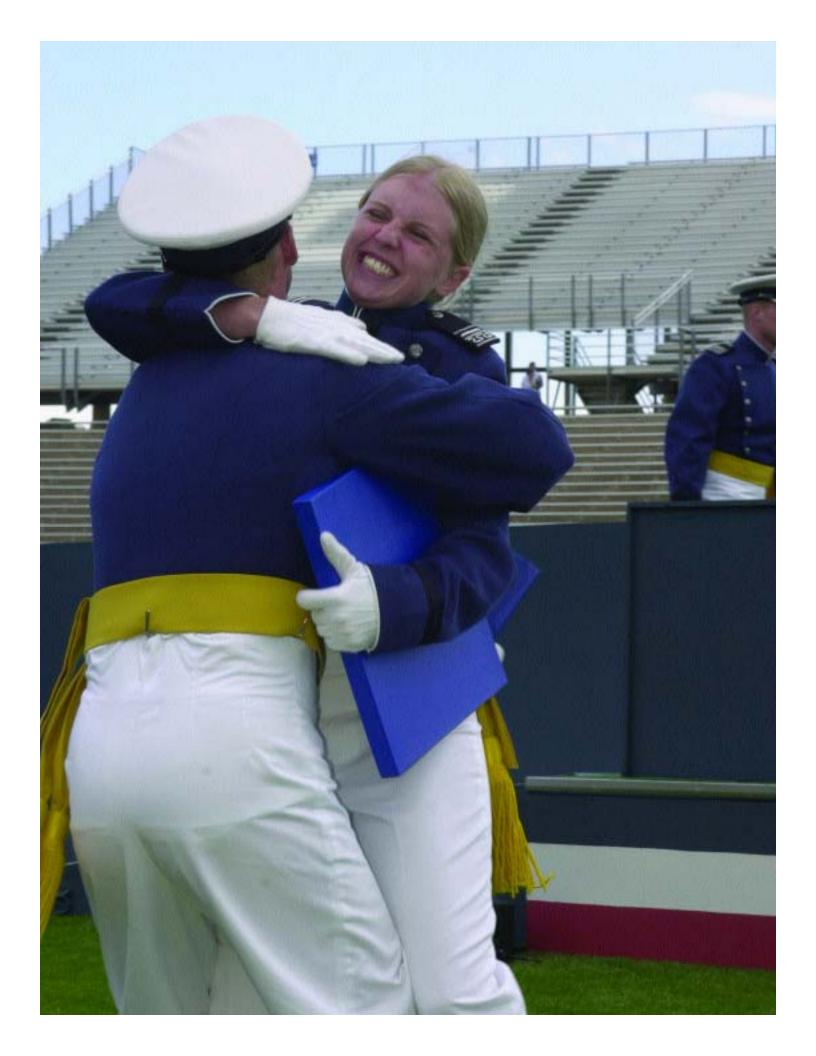
Take a kneeling position on the mat close to and directly behind the throwing line. Your knees must remain parallel to the throwing line. A maximum of three one-handed, overhead throws are allowed from this kneeling position to attain as great a distance as possible. You may use the non-throwing hand to steady the ball in preparation for the throw, you may not touch the floor or mat with either hand during or after any throw. A maximum or three legal trials are allowed. Your score will be the longest throw recorded, rounded down to the nearest foot.

Push-ups

Start from a position with the hands shoulder width apart, elbows fully extended, body straight and the feet no more than 12 inches apart. Lower your body, maintaining a straight back, until the upper arm is parallel with the ground then return to the start position. Once the two-minute push-up period has started, you may not lift your arms or legs off the ground. You may rest in the "start" position. You may also bend at the waist and the knees to relax the back, always maintaining 4-point contact with the ground. Before resuming push-ups, you must return to the start position.

300-Yard Shuttle Run

Using a sprint, crouch, or standup start with both feet behind the Start/Finish Line, you'll run six complete round trips between two lines spaced 25 yards apart for a total of 300 yards. You must make turns by placing at least one foot on or over the line at each turn. On the final trip, you must sprint past the Start/Finish Line. You must stay within a five-foot wide lane.



Appendix B

Traveling to the Air Force Academy

The Academy is located 55 miles south of Denver and just north of Colorado Springs on Interstate Highway 25. If you travel to the Academy by car, you will find that entrances to the Academy are clearly marked. From the North, you may enter the Academy at I-25 Exit 156. From the South, the access to the Academy is at I-25 Exit 150. Academy Boulevard, a major street that dissects Colorado Springs, goes from the eastern and southern part of the city directly to the south entrance of the Academy. See the detailed map of the Academy on page 190.

Air

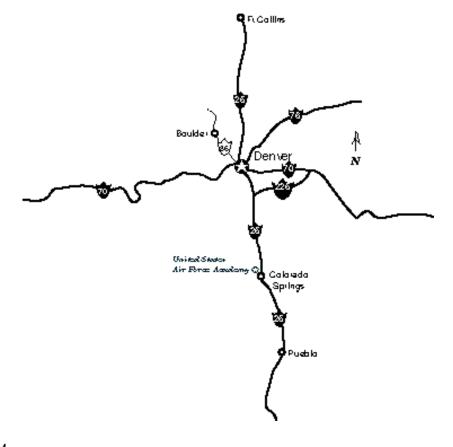
The Colorado Springs Airport is convenient to the Academy. Taxi and auto rentals are available at the airport. As you depart the airport, go west on Drennen Road to Powers Boulevard, go north to Woodmen Road, then west to Academy Boulevard, then north directly to the south entrance of the Academy. From Denver International Airport, go south on Peña Boulevard to I-70, go west to I-225, then southwest to I-25 and then south to the Academy.

Rail

Amtrak serves Denver. Taxi, auto rental, and bus service is available to Colorado Springs.

Bus

Greyhound serves Colorado Springs. Taxi and auto rentals are available. There is no city bus service to the Academy.







WHO CAN I CALL IF I HAVE QUESTIONS?

Prospective students may select from the list below to get answers to specific questions.

Topic Scenario/Point of Contact

Academic Enrollment in college bound courses. For guidance, you will be directed to your USAFA area counselor. Your last name and address will be

(Student) required to determine your counselor. **1-800-443-9266.**

Applications For requesting an application to USAFA. **1-800-443-9266.**

Athletic First Contact: local athletic contact officer (the POC with USAFA).

Status USAFA POC, Mr. Jim Bowman is available as a liaison for the coaches

and for any questions or concerns from ALOs on a candidate's athletic

status at USAFA. 1-719-472-1897

Internet The Academy admissions home page is available through the World Wide

Web. Once in Netscape or Internet Explorer, the internet address is:

academyadmissions.com

Medical Contact the Department of Defense Medical Examination Review Board

Status (DODMERB) **1-719-333-3562** and follow the menu directions.

Medical waiver status should also be referred to DODMERB (same

number as above).

Parents' Parent-related matters are handled by the Development/Alumni Programs

Club office. **1-719-333-3828.**

Preparatory Call your regional area counselor **1-800-443-9266**, for admission School questions. Your name and address will be requested to determine the

counselor.

Record Status Call your regional area counselor **1-800-443-9266**. Your name

(Student) and address will be requested to determine the counselor.

ROTC Applications for USAF ROTC scholarships are available from your local

Air Force recruiter. USAFA ROTC Liaison Office: 1-800-443-8187,

Option 1, then Option 6.

Summer Admissions Plans and Programs: Program for high school juniors entering

Seminar their senior year. Call **1-719-333-2236** or visit <u>academyadmissions.com</u>

and click on the Admissions Center and follow the link to Summer Seminar.

Sports Camp Athletic Department: Programs for students aged 8-18. Call 1-719-333-2116

or visit airforcesports.com and follow the link to Camps.

Tours of USAFA <u>Candidate/High School Student Tours</u>: Managed by Minority Enrollment

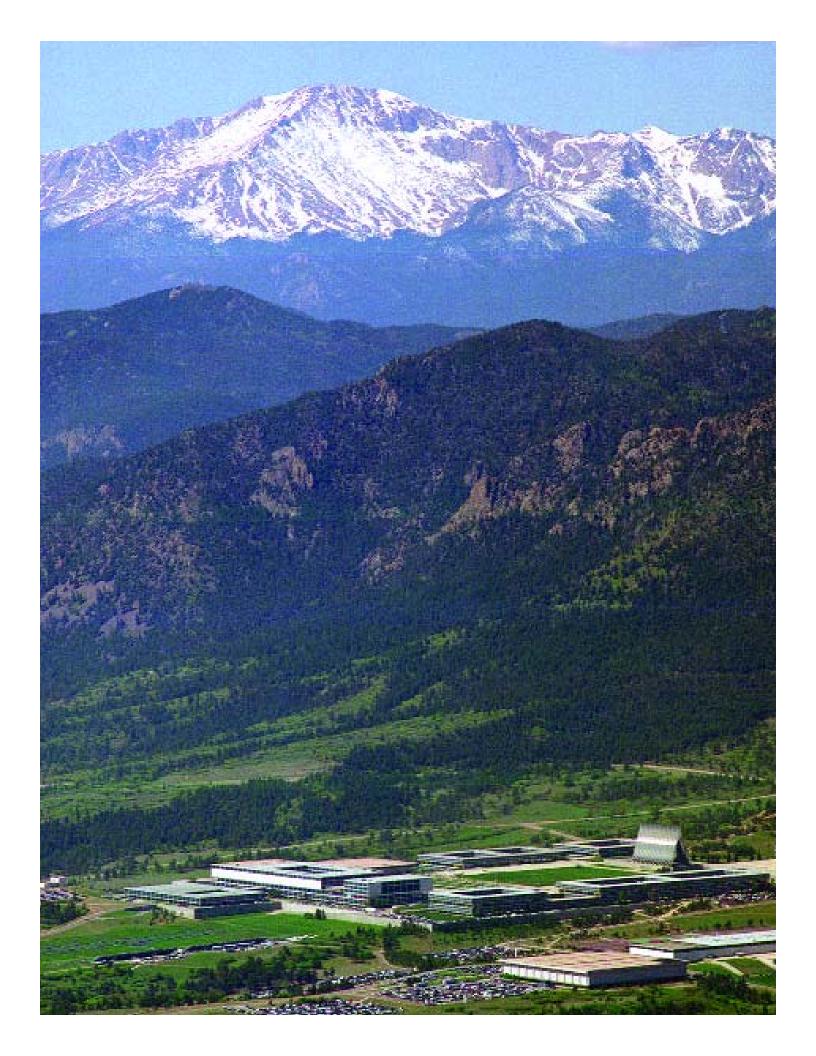
office from Monday to Friday except for final exams, holidays and Spring Break. (One tour daily at 9:00 a.m.) Parents attend briefing and are given a guided tour while candidate/student is escorted by a USAFA cadet. The candidate/student attends a class and eats lunch at the cadet dining facility (Mitchell Hall). **1-800-443-3864**, **Option 1** — **Ten days advance notice**

<u>is required.</u>

Group Tours: Civilian group, Distinguished Visitor (DV), and VIP tours

are managed by Visitor Services, a division of Public Affairs.

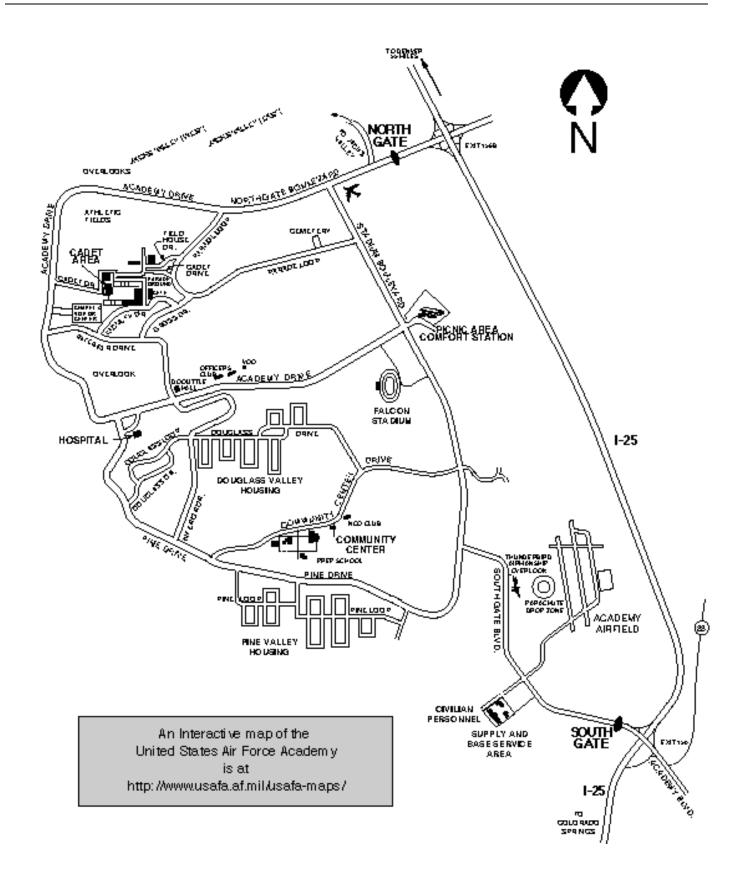
Call **1-719-333-7470.**



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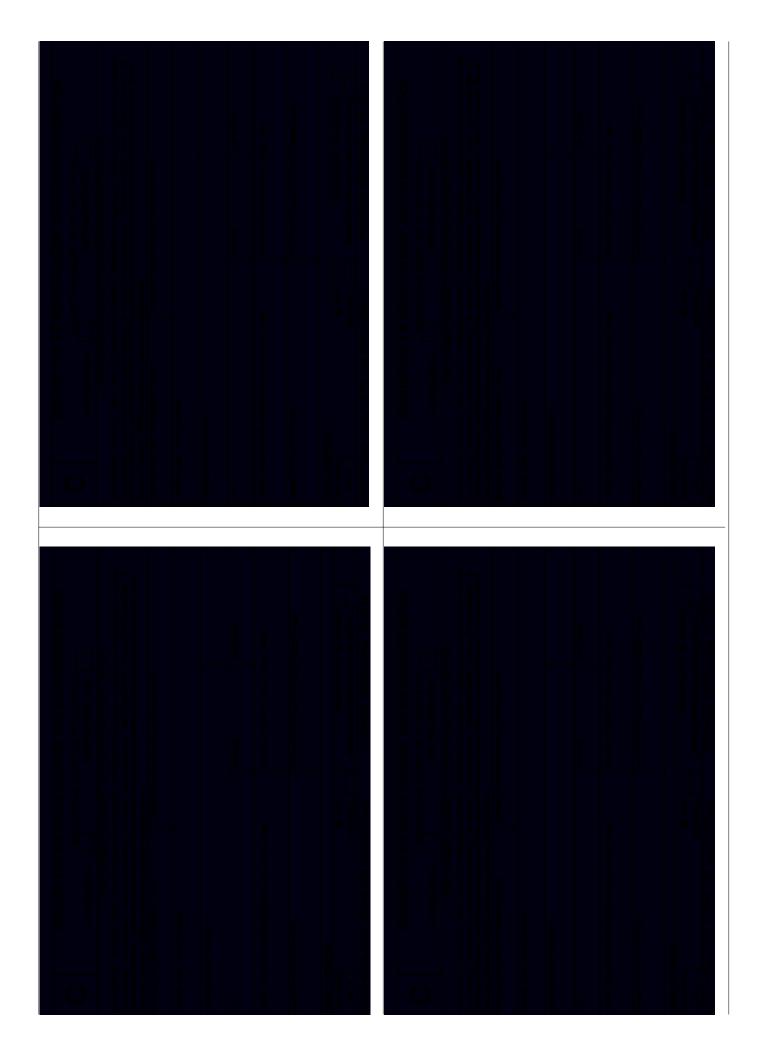
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